2014
State Agency Greenhouse Gas Reduction Report Card

Background

Under Section 12892 of Part 2.5 of Division 3 of Title 2 of the Government Code, the California Environmental Protection Agency (CalEPA) is required to prepare an annual report describing state agency actions to reduce greenhouse gas (GHG) emissions. CalEPA is required to compile and organize this information in the form of a 'Report Card' and post it on the CalEPA website. This report reflects information gathered in 2013. The reports of actual GHG reductions are current as of 2012, the last year of available data. Projections of future GHG emissions were current as of October 2013, when state agencies were required to submit their information to CalEPA.

The statute requires that the Report Card include the following:

- A list of those measures that have been adopted and implemented by the state agency with the actual GHG emissions reduced as a result of these measures.
- A list and timetable for adoption of any additional measures needed to meet GHG emission reduction targets.
- A comparison of the reductions from actions taken or proposed to be taken by a state agency to that agency's GHG emission reduction targets.
- An estimate of the greenhouse gas emissions from each agency's own operations and activities.

Climate Change Report Card Tables

The required information is organized into four tables as described below:

TABLE 1: <u>On-going Measures and Reductions in 2012</u>:

A number of GHG emission reduction measures are already in place and operational. Table 1 shows the emission reductions achieved by these measures in calendar year 2012, as reported to CalEPA by the responsible agencies.

TABLE 2: <u>GHG Reduction Strategies, and Timelines for Implementation</u>:

Table 2 includes measures anticipated for implementation over the next few years, along with the expected GHG reduction from each measure, and the timeframe for completion.

The timeframes noted in Table 2 reflect current estimates based on the work to date. Where the timetable indicates "To Be Determined (TBD)," work on the measure is in preliminary stages. Measures described as "on-going" have already begun but either the final completion dates are still to be determined, or they are programs being implemented on a continuous basis. Future Report Cards will update these completion dates as implementation efforts mature.

There are several factors to consider regarding the reported GHG emission reductions in Table 2. A number of strategies have cross-agency implementation responsibilities. Agencies will refine their reduction targets for these strategies as implementation actions progress. The total reduction for these measures may be listed twice in some cases to reflect that each agency is responsible for some portion of the reductions. Also, several individual measures

have interacting impacts so that the reduction numbers from each are not strictly additive (as recognized and explained in the AB 32 Scoping Plan, which can be found at http://www.arb.ca.gov/cc/scopingplan/scopingplan.htm).

TABLE 3: GHG Reduction Target Comparison:

Table 3 summarizes the reductions shown in Tables 1 and 2, and compares the 2020 goals from Table 2 with the annual reductions from current programs shown in Table 1. Reductions shown are only those achieved within California during the given year. The annual figures are not cumulative and do not reflect reductions that might occur out-of-state.

TABLE 4: Climate Action Team (CAT) – GHG Inventory Status:

Each CAT agency is required to report an estimate of the greenhouse gas emissions from their own operations and activities. Table 4 lists the CAT agencies, boards, departments and commissions, and the current status of the greenhouse gas inventory activities for each. The information in this Table was provided to CalEPA by the named agency or department.

The GHG inventories are conducted using protocols established by The Climate Registry (TCR)*. Inventories identified as 'verified' have been verified by an approved third party and submitted to the registry. The verified inventory reports can be found on the registry's websites: http://www.theclimateregistry.org/public-reports.

*Originally chartered by the state of California as the California Climate Action Reserve

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Abbreviations:

ARB – Air Resources Board

CAL FIRE – California Department of Forestry & Fire Protection

CDFA – California Department of Food & Agriculture

CEC – California Energy Commission

CalRecycle – California Department of Resources Recycling and Recovery

CPUC – California Public Utilities Commission

DGS – Department of General Services

DWR – Department of Water Resources

GHG – Greenhouse Gas

GW – Gigawatt

GWh – Gigawatt hour

GWP –Global Warming Potential

LEED – Leadership in Energy and Environmental Design (certification program)

MMBtu – Million British Thermal Units

$MMTCO_2E$ - Million Metric Tons of CO_2 Equivalent

$MTCO_2E$ - Metric Tons of CO_2 Equivalent

MW – Megawatt

MWh – Megawatt hour

OPR – Office of Planning and Research

SF_6 – Sulfur Hexafluoride

SWRCB – State Water Resources Control Board

TABLE 1: ONGOING MEASURES AND RELATED GHG EMISSION REDUCTIONS

$MMTCO_2e$ - Million Metric Tons of CO_2 Equivalent

California Air Resources Board Program Title	Description of Measures	Emission Reductions, $MMTCO_2e$	
		2011	2012
Pavley (AB 1493)	This regulation, required by AB 1493 (Pavley, Chapter 200, Statutes of 2002) sets fleet-average GHG standards for new passenger vehicles, phasing in over 2009-2016. The emission reductions increase to 26 $MMTCO_2e$ annually in 2020 as the GHG standards are fully implemented.	2.2	4.9
Diesel Anti-Idling	This Air Toxic Control Measure limits general idling of all commercial and publicly owned diesel-fueled vehicles with a gross vehicle weight of greater than 10,000 pounds. This regulation reduces diesel particulate matter and also reduces the amount of diesel fuel used in California, saving 50 million gallons per year. Each gallon saved reduces climate change emissions by 0.01005 metric tons of CO_2 ($MTCO_2e$).	0.5	0.4
Tire Pressure Program	This strategy requires specified automobile servicing businesses to ensure proper tire inflation at the time of service, as well as public education about proper tire inflation.	0.7	0.7

California Air Resources Board **Program Title**	**Description of Measures**	**Emission Reductions, $MMTCO_2e$**	
		2011	**2012**
Goods Movement (Drayage Trucks)	This regulation requires the reduction of GHG, diesel particulate matter (PM), and oxides of nitrogen (NOx) emissions from drayage trucks operating at, or transporting cargos to or from, California's ports and intermodal rail yards through retrofits, and fleet turnover of pre-1994 trucks. Staff estimates 100,000 $MTCO_2e$ reductions in 2011 based on difference in fuel economy between pre-1994 and newer engines, and the engine population published in ARB 2007 staff report.	0.1	0.1
Ship Electrification	This regulation requires most container, passenger, and refrigerated cargo ships to shut off their auxiliary engines while at dock and receive power from the electrical grid, or reduce their emissions by a similar amount via the implementation of other technologies. Staff estimates 18,000 $MTCO_2e$ reductions in 2012.	<0.1	<0.1
Reduction of Refrigerant Emissions from Non-Professional Services	This regulation requires a self-sealing valve on small cans of refrigerant, and a deposit and recycling program for the cans.	0.3	0.3
High Global Warming Potential GHG Reduction in Semiconductor Operations	This regulation requires semiconductor operations to use process optimization, alternative chemistries, and abatement technologies in combination or separately to reduce GHGs. The emission standards apply to semiconductor operations that emit more than 0.0008 $MMTCO_2e$ per year. Reduction of GHG emissions from this measure began in 2012.	**	0.2
Global Warming Potential Use in Consumer Products	This regulation sets Global Warming Potential (GWP) limits for compounds used in specific consumer products.	0.2	0.2

California Air Resources Board **Program Title**	**Description of Measures**	**Emission Reductions, $MMTCO_2e$**	
		2011	**2012**
Refrigerant Management Program	This regulation requires facilities with large refrigeration systems with more than 50 pounds of high-GWP refrigerant to conduct periodic leak inspections, promptly repair leaks, and keep service records on site. These facilities are also required to register and submit annual refrigerant usage reports to ARB. This regulation also affects any person who installs, services, or disposes of any appliance using a high-GWP refrigerant; as well as refrigerant wholesalers, distributors, and reclaimers. The regulation became effective January 1, 2011, With gradual implementation, no reductions were estimated for 2011. The 2012 emission reductions are based on facilities with "large" refrigeration systems (greater than 2,000 lbs.) that have reported. The annual leak rate from these facilities was reported to have been reduced from 23 to 12 percent annually. Additional reductions from facilities with "medium" sized refrigeration systems (200 to 2,000 lbs.) are also likely to have occurred, but these facilities will not report until 2014 and therefore any resulting reductions are not included.	**	0.5
SF_6 Emission Reductions from Gas Insulated Switchgear	This regulation sets an annual emission rate limit for sulfur hexafluoride as a proportion of an entity's capacity of sulfur hexafluoride in gas-insulated switchgear. The maximum allowable annual emission rate was ten percent for 2011 and will decrease one percent per year until 2020, at which point the maximum allowable annual emission rate remains at one percent.	<0.1	<0.1
Landfill Methane	This regulation requires enhanced control of methane emissions from municipal solid waste landfills and requires owners and operators to install gas collection and control systems at smaller and other uncontrolled landfills. Affected landfills are required to implement advanced methane monitoring requirements. Design Plans were required by June 17, 2011 and emission controls are required within 18 months after approval of the Design Plan for active municipal solid waste (MSW) landfills or within 30 months after approval of the Design Plan for closed or inactive MSW landfills.	**	0.1

California Air Resources Board **Program Title**	**Description of Measures**	**Emission Reductions, $MMTCO_2e$**	
		2011	**2012**
Low Carbon Fuel Standard	This regulation requires fuel providers in California to ensure that the mix of fuel they sell into the California market meets, on average, a declining standard for GHG emissions measured in CO_2 equivalent grams per energy unit of fuel sold. Estimated reductions in 2011 and 2012 include those achieved by over-compliance with the regulation.	1.3	1.6
Heavy-Duty Vehicle Aerodynamic Efficiency	This regulation reduces GHG emissions from long-haul tractors and 53-foot or longer dry-van and refrigerated-van trailers pulled by these tractors, by requiring them to be either U.S. Environmental Protection Agency SmartWay certified or retrofitted with SmartWay verified aerodynamic technologies and low rolling resistance tires.	0.1	0.1
Medium- and Heavy-Duty Vehicle Hybridization	This incentive program reduces the GHG emissions of urban, stop-and-go vehicles, such as parcel delivery trucks and vans, utility trucks, garbage trucks, transit buses, and other vocational work trucks, through the use of hybrid and zero-emission technology. Incentives for hybrid and zero-emission trucks became available starting the first quarter of 2010 and the program will continue into 2014 with up to $15 million in additional funding augmenting the $54 million previously allocated.	<0.1	<0.1
With California Energy Commission, California Building Standards Commission Specifications for New Supermarket Refrigeration	The measure sets minimum prescriptive standards for energy efficient refrigeration systems and for design and installation of leak-tight refrigeration systems, which will apply to new supermarket construction and new supermarket refrigeration installation beginning January 1, 2014. The measures have been added to the California Title 24 Building Standards Code, Part 6 (Energy Efficiency), and Part 11 (Green Building Standards Code). GHG emission reductions are expected from increased energy efficiency, and from reduced refrigerant leakage. Estimated reductions are expected to be 0.5 $MMTCO_2e$ annually by 2020, and as more supermarkets replace their older systems with newer systems, the reductions are expected to achieve a maximum of 1.2 $MMTCO_2e$ annually by 2030	N/A	N/A
ARB NOTES:	** Emission reduction not quantified.		

California Department of Forestry and Fire Protection (CAL FIRE) **Program Title**	**Description of Measures**	**Emission Reductions, $MMTCO_2e$**	
		2011	**2012**
Sustainable Forests (various programs)	Existing state and federal regulations and assistance programs. Recent research shows California forests increasing in growing stock[1] and likely sequestering more than 5.0 $MMTCO_2e$ per year.[2] CAL FIRE, federal and other known state forest sector activities contributing to current sequestration rates include:		
Forest Practices	Annual benefit from California Forest Practice Act rule changes instituted in December 2004 equals 2.2 $MMTCO_2e$.[3]	2.2	2.2
Urban Forestry	CAL FIRE funded planting of 13,098 trees in 2012 for a cumulative total of 75,988 trees since 2005 resulting in annual reductions of 0.0009 $MMTCO_2e$.[4] Annual sequestration is based on cumulative numbers of trees since sequestration increases over time as trees mature. Educational programs enhance effectiveness of voluntary tree planting by homeowners, utilities and others, but we cannot reliably track voluntary outputs at this time.	<0.1	<0.1
Forest Legacy	CAL FIRE conserved 10,083 acres in 2012 for a one time avoided conversion emission of 0.30 $MMTCO_2e$.[5] Ongoing annual uptake benefits from conservation purchases by other agencies in 2005-2007 total 0.02 $MMTCO_2e$.[6] CAL FIRE has not tracked subsequent conservation purchases. .	0.5	0.3

California Department of Forestry and Fire Protection (CAL FIRE) **Program Title**	**Description of Measures**	**Emission Reductions, $MMTCO_2e$**	
		2011	**2012**
-Vegetation Management Program (VMP)	CAL FIRE conducted fuel reduction on 10,846 acres using mechanical or manual treatments and 10,412 acres using prescribed burning in 2012. No reliable methodology for calculating avoided fire emissions is available at this time. Biomass is not being used for energy, thus no avoided fossil fuel benefits are being realized at this time. Not tracking fuel treatments and biomass utilization by federal agencies. CAL FIRE's is revising its Vegetation Treatment Program EIR and will conduct a more detailed analysis of fuel treatment emissions.[7]	N/A	N/A
California Forest Improvement Program (CFIP)	CFIP planted 196 acres in 2012 for a cumulative total of 1950 acres since 2005. Annual sequestration from cumulative acres planted since 2005 are still negligible, since methodology assumes near-term emissions from site preparation treatment. Methodology likely underestimates benefits for reforestation projects conducted immediately after wildfires, however, and should be revisited.[8]	0	0
CAL FIRE NOTES:	1 Christensen, Glenn A.; Sally J. Campbell; Jeremy S. Fried, tech. eds. 2008. California's forest resources, 2001–2005: five-year Forest Inventory and Analysis report. Gen. Tech. Rep. PNW-GTR-763. Portland, OR: U.S.D.A,, Forest Service, Pacific Northwest Research Station. 183 p. [2] Smith, James E., and Linda S. Heath. 2008. Carbon stocks and stock changes in U.S. forests, and Appendix C. P. 65-80, C-1-C-7 in: U.S. Department of Agriculture. U.S. Agriculture and Forestry Greenhouse Gas Inventory: 1990-2005. Technical Bulletin No. 1921. [3] CAL FIRE, Forest Conservation Management Strategy, AB 32 Scoping Plan, Appendix C, p. 166. [4] Benefits estimated using methodology developed for Urban Forestry Strategy in AB 32 Scoping Plan. [5] Benefits estimated using methodology developed for Forest Conservation Strategy in CAT Report and AB 32 Scoping Plan. [6] Personal communication, DFG; Resources Agency Prop 40/50 database. [7] Personal communication, CAL FIRE Vegetation Management Program. [8] Benefits estimated using methodology developed for Reforestation Strategy for AB 32 Scoping Plan.		

California Department of Resources, Recycling and Recovery (CalRecycle) **Program Title**	**Description of Measures**	**Emission Reductions, $MMTCO_2e$**	
		2011	**2012**
Statewide Recycling	Increased recycling in the manufacturing of products reduces GHG emissions through reductions in energy-intensive material extraction and production, as well as methane emission from landfills. In 2005, California surpassed the mandated 50 percent goal of diverting recyclable materials from landfills and has steadily increased the diversion rate to 65 percent in 2012.[1] In 2011, AB 341 (Chesbro, Chapter 476, Staatutes of 2011) mandated a statewide recycling goal of 75 percent by 2020. The Waste Management Sector Plan in the 2013 update to the Scoping Plan outlines activities to achieve the 75 percent goal. The program has the potential to reduce GHG emissions by 20 to 30 $MMTCO_2e$; however, many of the reductions would likely take place outside of California.	**	**
CalRecycle NOTES:	** Emission reduction not quantified. [1] The Disposal Measurement System Act (SB 1016) changed the way State agencies and local governments measure their progress toward meeting the statutory waste diversion mandates. SB 1016 requires per capita disposal numbers, along with evaluating program implementation efforts. For 2012, the estimated statewide "diversion rate equivalent" was 65 percent. AB 341 mandates 75 percent reuse, recycling, or composting by 2020.		

California Department of Transportation (Caltrans) **Program Title**	**Description of Measures**	**Emission Reductions, $MMTCO_2e$**	
		2011	**2012**
Alternative Cement and Concrete Strategies	In 2009, Caltrans amended their Standard Specifications for concrete to allow contractors to use less energy-intensive concrete mixes. These alternatives include fly ash, blast furnace slag, and silica fume. Caltrans is also looking into ways to reduce GHG emissions associated with concrete. These include; researching the potential of using roller-compacted concrete, which requires less cement as a binding agent, using recycled aggregates in concrete, which reduces life-cycle emissions, using pervious concrete, which is more porous than typical concrete and allows rainwater to pass down to the soil.	. <0.1	<0.1
Alternative Asphalt Strategies	Caltrans has multiple initiatives to reduce the carbon content of asphalt and the energy required to lay it; Cold-in-place Recycling, Rubberized hot-mix Asphalt, and Rubberized warm-mix Asphalt. Caltrans use of alternatives to hot mix asphalt reduces its operational GHG emissions by over 61,000 tons per year.	<0.1	<0.1
Alternative Fuel and Fleet Strategies	Caltrans has been working to conserve fleet fuel use since the mid-1980s by developing more efficient ways to manage the fleet. Recent efforts focus on using alternative fuels and more efficient vehicles in its fleet and equipment, including: Biodiesel fuel, Ethanol fuel, Liquefied petroleum gas (propane), Compressed natural gas (CNG), Hydrogen fuel cell vehicles, and Hybrid electric vehicles. As of 2009, Caltrans had switched to alternative fuel sources for 3,000 vehicles.	<0.1	<0.1

California Department of Transportation (Caltrans) **Program Title**	**Description of Measures**	**Emission Reductions, $MMTCO_2e$**	
		2011	**2012**
Alternative Employee Commuting Strategies	Caltrans has many employee commute programs in place that reduce the need to drive to work. These include monthly bus passes, emergency ride home vouchers, subsidies for vanpools, carpool matching services, and secure-access bicycle parking.	<0.1	<0.1
LED Roadway Lighting	Over the past several years, Caltrans has begun to require that most of the highway lighting system use light-emitting diode (LED) light fixtures. Statewide deployment started in 2010, full project funding was approved in February 2012, and full deployment is expected in 2014/2015.	<0.1	<0.1
Facility Efficiency and Energy Conservation	Caltrans has improved the energy efficiency of existing Caltrans buildings and has constructed new facilities that meet LEED standards. Several of the most widely-deployed strategies to reduce GHG emissions at Caltrans administrative facilities, include: LEED certified buildings, data center upgrades, energy efficient lighting, low flow toilets and water fixtures, other energy efficiency upgrades and retrofits.	<0.1	<0.1

California Department of Food and Agriculture **Program Title**	**Description of Measures**	**Emission Reductions, $MMTCO_2e$**	
		2011	**2012**
Fertilizer Research and Education Program	In collaboration with the Air Resource Board and the California Energy Commission, the CDFA Fertilizer Research and Education Program (FREP) is funding research to understand nitrous oxide (N_2O) levels from nitrogen fertilizers added to corn, tomatoes, and cotton crops. Research began in 2009. Research for tomatoes and cotton is expected to be completed at the end of 2013. Corn research will be completed at the end of 2014. Several research projects related to GHG reductions were funded under the 2010 Specialty Crop Block Grant Program. The research focus called for projects that address specialty crop agriculture's contribution to adaptation and/or mitigation of climate change. Dairy systems generate significant amounts of methane from onsite waste lagoons. A dairy digester (or biodigester) is a technology that uses dairy waste to generate and capture methane gas which is in turn used for energy production. This process results in reduced greenhouse gas emissions from dairy systems. CDFA, U.S. Environmental Protection Agency, and U.S. Department of Agriculture will work with other relevant state and local agencies, as well as industry stakeholders, to address the technical, regulatory and economic barriers for a robust dairy digester sector in California. Biofuels (fuels from plants) have been found to release less GHG compared to fossil fuels. CDFA, in partnership with scientists at UC Davis, and with funding from the California Energy Commission Public Interest Energy Research Program, have undertaken a three-year study to evaluate the economic, beneficial environmental factors, and costs of the biofuel feedstock crops. A final report of the research findings will be available in August, 2013.	**	**

California Department of Food and Agriculture **Program Title**	**Description of Measures**	**Emission Reductions, $MMTCO_2e$**	
		2011	**2012**
Fuel Quality and Standards	CDFA's Division of Measurement Standards is responsible for evaluating fuel quality and standards in California. CDFA is an active member of the Low Carbon Fuel Standard (LCFS) Advisory Panel. Under the LCFS, alternative fuels such as hydrogen, biodiesel and electricity will be evaluated for reducing carbon dioxide GHG emissions from motor vehicles. CDFA has developed quality standards for hydrogen to be used in fuel cell vehicles.	**	**
CDFA NOTES:	** Emission reduction not quantified.		

California Energy Commission **Program Title**	**Description of Measures**	**Emission Reductions, $MMTCO_2e$**	
		2011	**2012**
Appliance Energy Efficiency Standards	The Appliance Efficiency Regulations increase efficiency of appliances sold to California consumers and businesses. Emission reductions result from energy-efficient appliances consuming less electricity and natural gas, thereby avoiding emissions associated with electricity generation and natural gas combustion. Using the California Energy Demand (CED) 2013 forecast and 2007 as a base year, cumulative electricity savings for 2008 and 2009 were 2,247 GWh, 3,858 GWh in 2010, 5,383 GWh in 2011 and 6,705 in 2012.[1] Cumulative natural gas savings from appliance standards for 2008 and 2009, 2010, 2011 and 2012 were 69, 73, 110 and 133 million therms, respectively.[2] Estimates use a CO_2 emissions factor for each MWh of electricity avoided of 0.267 $MTCO_2E$.[3] Estimates use a CO_2 emissions factor for each MMBtu of natural gas combustion avoided of 0.00529 $MTCO_2e$. One therm equals 0.1 MMBtu.	2	2.5
Building Energy Efficiency Standards	The Building Energy Efficiency Standards are designed to increase the efficiency of all newly constructed residential and nonresidential buildings and additions and alterations to existing buildings in California. The strategy is to develop, implement, and enforce standards that require and result in reductions in energy and water use in buildings. Estimates use a CO_2 emissions factor for each MWh of electricity avoided of 0.267 $MTCO_2e$.[3] Estimates use a CO_2 emissions factor for each MMBtu of natural gas combustion avoided of 0.00529 $MTCO_2$. Using the CED 2013 revised forecast and 2007 as a base year, cumulative electricity savings for 2008 and 2009 was 873 GWh, 1,304 GWh in 2010, 1,832 GWh in 2011, and 2,315 GWh in 2012. Cumulative natural gas savings from building standards for 2008 and 2009, 2010, 2011, and 2012 were 78, 56, 82, and 87 million therms, respectively.[4]	0.9	1.1

California Energy Commission **Program Title**	**Description of Measures**	**Emission Reductions, $MMTCO_2e$** **2011**	**2012**
Comprehensive Publicly Owned Utility Customer Energy Efficiency Programs	The publicly owned utilities (POU) in California offer electricity efficiency (EE) programs to their ratepayers. The publicly owned utilities reported GHG emissions reductions for the first time in 2007. Their programs achieved cumulative savings of 1,046 GWh for 2008 and 2009 or emissions reductions of 0.28 $MMTCO_2E$. POU EE savings 2008-2010 was 1,569 GWh for 0.42 $MMTCO_2e$.[5] Electricity savings totaled 2,029 GWh for 2008-2011 for 0.54 $MMTCO_2e$. Five years of POU EE savings between 2008-2012 equal 2,468 GWh for 0.66 MMTCO2e. The previous report card used 0.313 $MTCO_2e$ per MWh avoided. All figures have been updated using a GHG factor of 588 lbs CO_2/MWh or 0.267 $MTCO_2e$ per MWh avoided.[3]	0.5	0.7

CEC NOTES:

[1] The estimates are based on the California Energy Demand 2014-2024 (CED 2013) revised mid-case scenario which can be found at: http://www.energy.ca.gov/2013_energypolicy/documents/2013-10-01_workshop/spreadsheets/Mid/.

[2] The estimates reflect the California Energy Demand 2014-2024 (CED 2013) revised mid-case scenario which can be found at: http://www.energy.ca.gov/2013_energypolicy/documents/2013-10-01_workshop/spreadsheets/Mid/.

[3] In this report card, the Energy Commission staff used an updated GHG emission factor of 588 lbs CO_2/MWh or 0.267 $MTCO_2$/MWh to better estimate the emission attributes of the electricity system for the period 2008 through 2012. In the previous report card, the Energy Commission used a GHG emissions factor of 690 lbs CO_2e per MWh. The Energy Commission currently uses the 588 lbsCO_2/MWh or 0.267 $MTCO_2$/MWh GHG emission factor consistent with the most recent update to the Title 24 Building Code energy efficiency standards. The Energy Commission is working with other agencies to develop a consistent methodology for estimating GHG emission reductions from efficiency and renewable energy projects in California.

[4] The estimates reflect the California Energy Demand 2014-2024 (CED 2013) revised mid-case scenario which can be found at: http://www.energy.ca.gov/2013_energypolicy/documents/2013-10-01_workshop/spreadsheets/Mid/; cumulative energy savings can be negative in a given year because many factors affect total energy consumption, including changes in the price of energy (e.g., drop in natural gas prices).

[5] Cumulative energy savings from publicly owned utility energy efficiency programs for years 2009-2012 are reported in *Energy Efficiency in California's Public Power Sector – A Status Report* (2013), page 2. These energy savings figures have not been systematically evaluated by the POUs or the Energy Commission. The Energy Commission is working to develop a standardized approach to evaluation of POU energy efficiency program savings estimates.

California Public Utilities Commission **Program Title**	**Description of Measures**	**Emission Reductions, $MMTCO_2e$**	
		2011	**2012**
California Solar Initiative	Senate Bill 1 established a $3 billion rebate program to support the deployment of 3000 MW of distributed solar generation capacity statewide through 2016. The CPUC's portion of this goal and associated budget is 1,940 MW and $2.4 billion. To calculate the avoided emissions enabled by this program, each MWh of electricity is assumed to displace energy with the following utility-specific emissions factors: 0.26 $MTCO_2e$ for Pacific Gas & Electric (PG&E); 0.32 $MTCO_2e$ for Scouthern Califronia Edison (SCE); and 0.35 $MTCO_2e$ for San Diego Gas & Electric (SDG&E). Reductions for 2012 are based on systems installed and operating through 2012, which represented a total of 1,056 MW nameplate capacity.	0.3	0.5
California Solar Initiative – Thermal Program (Solar Water Heating)	The CPUC's California Solar Initiative (CSI)-Thermal program offers incentives based on the amount of natural gas or electricity displaced by solar water heaters. Incentives are available for residential, multifamily and commercial applications. The program was created in January 2010 (by Decision (D).10-01-022 and modified in 2012 by D.12-08-008, pursuant to AB 1470). In 2007, the Legislature authorized a new $250 million program to be funded by natural gas ratepayers with a goal of promoting 200,000 solar thermal systems that displace natural gas use by 2017. In 2011, the CPUC authorized a low-income component of the CSI-Thermal Program with a $25 million budget dedicated to low-income solar water heating incentives funded by gas ratepayers pursuant to AB 1470 (Huffman, Chapter 536, Statutes of 2007). In 2012, CSI-Thermal systems installed to date result in reductions of 4,700 $MTCO_2e$ per year.	<0.1	<0.1

California Public Utilities Commission **Program Title**	**Description of Measures**	**Emission Reductions, $MMTCO_2e$**	
		2011	**2012**
Investor-Owned Utilities Energy Efficiency Programs	The CPUC funds energy efficiency (EE) programs through the resource procurement budgets of the utilities, as required by Public Utilities Code Section 454.5 (b) (9) (C). The programs developed for energy efficiency reach residential - single family, residential - multi-family, commercial, industrial, and agricultural customers of investor-owned distribution utilities. Reductions in 2011 are based on gross savings from installed and operating measures from the 2007 through 2012 program years, including 7.8 percent assumed avoided line losses for consistency with the methodology of ARB's Climate Change Scoping Plan. Cumulative gross savings in 2012 were 19 million MWh of electricity (absent avoided line losses) and 273 million Therms of natural gas. Each MWh of electricity avoided emissions by 0.28 $MTCO_2e$, the weighted average emissions intensity of PG&E, SCE and SDG&E.[i] Each avoided Therm is assumed to reduce emissions by 0.0053156 $MTCO_2e$, reflecting the CO_2 that would otherwise be emitted through the combustion of natural gas.	6.2	7.2
Renewables Portfolio Standard	The California Renewables Portfolio Standard (RPS) Program was established by SB 1078 (Sher, Chapter 516, Statutes of 2002), and has been subsequently modified by SB 107 (Simitian, Chapter 464, Statutes of 2006), SB 1036 (Perata, Chapter 685, Statutes of 2007) and SB 2 (1x) (Simitian, Chapter 1, Statures of 2011-12 First Extraordinary Session). The RPS program is codified in Public Utilities Code Sections 399.11-399.20. Under SB 2 (1x), the RPS program administered by the CPUC requires each retail seller to increase its total procurement of eligible renewable energy resources so that 33 percent of retail sales are served by eligible renewable energy resources no later than December 31, 2020. Emissions reductions in 2009 through 2012 represent the increased renewable energy procurement compared to 2007 levels. Total RPS procurement by PG&E, SCE and SDG&E in 2012 was 32,931,393 MWh, approximately 20 percent of annual retail sales. Each MWh of electricity avoids 0.26 $MTCO_2e$ for PG&E; 0.32 $MTCO_2e$ for SCE; and 0.35 $MTCO_2e$ for SDG&E.[1]	3.5	3.2
CPUC NOTES:	[1] CEC uses a GHG emission factor relied upon by CARB for analysis of the Scoping Plan: 961 $lbsCO_2$/MWh or 0.436 $MTCO_2$/MWh. CPUC uses emission factors for investor-owned utilities based on the 2013 E3 GHG Calculator, which are lower than the statewide average.		

Department of General Services (DGS) **Program Title**	**Description of Measures**	**Emission Reductions, $MMTCO_2e$**	
		2011	**2012**
Green Buildings - LEED	This measure reduces GHG emissions associated with the design and construction of state-owned or state-leased buildings. During 2012, 17 new, renovated, or existing buildings totaling 829,277 sq. ft. were completed and LEED certified. This included ten leased buildings. These buildings all exceed current Title 24 code requirements, for an estimated total reduction of 964 $MTCO_2e$. The combined reduction in electricity usage from what it would be if the buildings were designed to code is used to compute the GHG reductions.	<0.1	<0.1
Green Buildings – Distributed Generation	This measure reduces GHG emissions associated with the installation of clean on-site renewable generation. In 2012, 17 MW were installed at State facilities, with more being installed in 2013 and 2014. Systems installed in 2012 generated 11,508,000 kWh. Efforts continue to expand distributed generation programs further, including a Request for Proposals for wind generation.	<0.1	<0.1
Green Buildings – Existing State Buildings Retro-Commissioning	This measure reduces GHG emissions associated with the optimization of energy systems and improvement of environmental performance in existing buildings. No Retro-commissioning projects have taken place since 2011 due to budget constraints, however, DGS is now moving forward with developing a monitoring-based commissioning (MBCx) program. The first MBCx project is scheduled to be installed in 2014.	<0.1	0
High-Performance Schools	The State provides incentives for high-performance schools through Prop 1D administered through the Office of Public School Construction (OPSC) and verified by the Division of the State Architect (DSA). Total reported savings result from 41 High Performance Incentive Grants issued in 2012. The estimated energy reductions associated with these projects total 202,000 MMBtu/year, which equals 10,695 $MTCO_2e$/year of avoided CO_2 emissions.	<0.1	<0.1

California Department of Water Resources (DWR) **Program Title**	**Description of Measures**	**Emission Reductions, $MMTCO_2e$**	
		2011	**2012**
End Use Water Conservation & Efficiency	In 2009, DWR, in cooperation with other State agencies, released the final report of the "20X2020" Water Conservation Program, which established the baselines and targets for reducing statewide per capita urban water use by 20 percent by the year 2020. This program was later supplemented by the SBX7-7 Water Conservation Act of 2009 (Steinberg, Chapter 4, Statutes of 2009-2010 Seventh Extraordinary Session), which includes water conservation and water use efficiency for both urban and agricultural water uses. The Department is also quantitatively evaluating the water savings/energy savings/GHG emission reductions in our previously funded projects. New Proposal Solicitation Packages will include specific requirements for quantifying these same savings and reductions. The Department's Integrated Regional Water Management grant program adopted a climate change standard which includes consideration of water-related GHG emissions. The Urban Water Management Plan guidelines were revised to recommend the inclusion of a climate change element that addresses the water-energy nexus. SBX7-7 also requires agricultural water suppliers to include an analysis, based on available information, of the effect of climate change on future water supplie, in their agricultural water management plans. DWR guidebook for preparation of agricultural water management plans includes guidance to water suppliers.	**	**
DWR NOTES:	** Emission reduction not quantified.		

TABLE 2: GHG EMISSION REDUCTION STRATEGIES, AND TIMELINES FOR IMPLEMENTATION

Numbered footnotes appear at the end of Table 2. **Notes** identified with asterisks are at the end of each agency's section.

$MMTCO_2e$ - Million Metric Tons of CO_2 Equivalent

Scoping Plan: Strategy Number or Chapter / Section	Agency[1] and Sector	Name	Implementation Timeline	Activities since last Report Card	Expected GHG Emission Reductions in 2020[2] ($MMTCO_2e$)	Brief Description
	AIR RESOURCES BOARD (ARB) STRATEGIES					
	AGRICULTURAL SECTOR					
A-1	ARB	Methane Capture at Large Dairies	Voluntary Measure Implementation 2017-2020	ARB staff approved 26 livestock early action listings. Two projects have been approved to date with additional projects currently under review.	1 [3]	This measure encourages voluntary installation of anaerobic digesters at large dairies through economic incentives such as marketable emission reduction credits (offsets), favorable utility contracts, or renewable energy incentives. ARB is collaborating with CDFA, State Water Board and other stakeholders to identify and reduce barriers to greater digester use. This measure is also shown under those being implemented by CDFA. GHG reductions are attributed to CDFA totals.
	ELECTRICAL AND NATURAL GAS SECTOR					
E-3	CPUC, CEC, ARB	Renewables Portfolio Standard (Previously called Renewable Electricity Standard)	SB 2 (1x) (Simitian, Chapter 1, Statures of 2011-12 First Extraordinary Session), Effective Dec-2011	ARB is working with CPUC and CEC on implementation.	Reduction included in CPUC totals	This measure increases the use of renewable electricity required by the Renewables Portfolio Standard (RPS). California electric utilities must obtain 33 percent of their electricity from eligible renewable energy resources by 2020.
	HIGH GLOBAL WARMING POTENTIAL (GWP) GASES					
H-1	ARB	HFC Reduction Strategies: Motor Vehicle Air Conditioning Systems: Reduction of Refrigerant Emissions from Non-Professional Servicing	Approved Jan-2009; Implemented Jan-2010; Phase-in complete Jan-2011	Implementation ongoing. Certified seven products for sale in California. Inspected refrigerant recovery facilities.	0.26	This regulation requires a self-sealing valve on small cans of refrigerant, and a deposit and recycling program for the cans.
H-2	ARB	SF_6 Limits in Non-Utility and Non-Semiconductor Applications (Discrete Early Action)	Approved Feb-2009 Implementation 2010	Implementation ongoing.	< 0.1	This regulation places restrictions on nonessential end uses of SF_6, where feasible alternatives are available.
H-3	ARB	High GWP GHGs Reduction in Semiconductor Operations (Discrete Early Action)	Approved Feb-2009 Implementation 2010	ARB is collaborating with local air districts on implementation.	0.2	This regulation requires semiconductor operations (operations) to use process optimization, alternative chemistries, and abatement technologies in combination or separately to reduce GHGs. The emission standards apply to operations that emit more than 0.0008 $MMTCO_2e$ per year. Emission reductions began in 2012.
H-4	ARB	Limit High GWP Use in Consumer Products--Pressurized Gas Duster GWP Limit of 150 and Other Consumer Product Categories (Discrete Early Action)	Approved Jun-2008 Implementation 2010	Implementation ongoing.	0.23	This regulation requires setting GWP limits on specific consumer products.
H-5	ARB	High GWP Reductions from Mobile Sources: 1) Low GWP Refrigerants for New Vehicle Air Conditioning Systems.	1) Approved-January 2012; Implementation 2017 model year	Part of Advanced Clean Cars program	0.6	1) Measure provides credit incentives for using low GWP refrigerants for use with the air conditioning systems on new vehicles. This measure has been integrated into the Advanced Clean Cars Measure and therefore reductions from this activity are not counted toward the 0.6 $MMTCO_2e$ in reductions for H-5.
		2) Air Conditioner Refrigerant Leak Test During Vehicle Smog check.	2) On hold.	Measure not feasible at this time.		2) Proposes the addition of a refrigerant leak check on motor vehicle air conditioning systems when smog check is required.
		3) Refrigerant Recovery from Decommissioned Refrigerated Shipping Containers	3) On hold.	Measure not feasible at this time.		3) Addresses the recovery of refrigerants from decommissioned refrigerated shipping containers.
		4) Enforcement of Federal Ban on Refrigerant Release during Servicing or Dismantling of Motor Vehicle Air Conditioning Systems	4) On hold.	Measure not feasible at this time.		4) Enforcement of federal ban on refrigerant release during servicing or dismantling of motor vehicle air conditioning systems.

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Scoping Plan: Strategy Number or Chapter / Section	Agency[1] and Sector	Name	Implementation Timeline	Activities since last Report Card	Expected GHG Emission Reductions in 2020[2] ($MMTCO_2e$)	Brief Description
H-6	ARB	High GWP Reductions from Stationary Sources: 1) High-GWP Refrigerant Management Program for Stationary Sources Refrigerant Registration /Reporting/Repair Program	Approved Dec-2009; Implementation 2011	Implementation ongoing.	5.9	1) Measure to reduce emissions of high GWP refrigerants from stationary, non-residential refrigeration equipment through leak detection and repair, system retrofit or retirement, and reporting and recordkeeping requirements.
		2) Specifications for Commercial and Industrial Refrigeration Systems	CEC to consider in 2012-13; Implementation Jan 2014	Adopted by CEC and CBSC.		2) Measure to reduce both direct emissions of high GWP refrigerants resulting from the design and installation and indirect emissions resulting from energy consumption of large supermarket refrigeration systems.
		3) Foam Recovery and Destruction Program	On hold.	Measure not feasible at this time.		3) Measure for the collection of foam followed by recycling or destruction of high GWP gases.
		4) SF_6 Emission Reductions from Gas Insulated Switchgear	Approved Feb-2010; Implementation 2011	Implementation ongoing.		4) Measure to set maximum SF_6 emission rate for gas insulated switchgear.
		5) Alternative Fire Suppressants	On hold.	Measure not feasible at this time.		5) Use of leakage reduction methods and/or lower GWP fire suppression agents.
		6) Residential Refrigeration Early Retirement / Voluntary Program	TBD	Measure not feasible at this time.		6) ARB work with utilities to encourage recovery of high GWP materials from residential refrigerators at end of life.
H-7	ARB	Mitigation Fee on High GWP Gases	On hold.	Measure not feasible at this time.	N/A	This regulation proposes establishment of an upstream fee on high GWP gases based on their GWP.
	INDUSTRY SECTOR					
I-1	ARB	Energy Efficiency and Co-Benefits Assessments for Large Industrial Sources	Approved Jul-2010; Implementation 2010	Implementation ongoing.	N/A	This regulation requires major industrial facilities to conduct an assessment of the potential to reduce GHG emissions, and possible co-benefits for criteria air pollutants and toxic air pollutants.
I-2	ARB	Oil and Gas Extraction GHG Emission Reduction	Board to consider 2014; Implementation TBD	Regulatory development ongoing.	0.2	This measure would require controls to minimize the venting and fugitive emissions of methane and carbon dioxide from crude oil and natural gas production, processing, and storage operations.
I-3	ARB	GHG Leak Reduction from Natural Gas Transmission and Distribution	Measure currently on hold.	Continuing to evaluate.	0.9	Replace pipelines, compressor stations, and meter and regulating stations, as well as improve maintenance and inspection requirements for valves and flanges.
I-4	ARB	Refinery Flare Recovery System Improvement	Measure no longer being considered.	Equivalent measure implemented by local air districts.	N/A	This measure proposed to minimize GHG emissions by recovering gases before they are combusted by the refinery flare. The system collects the gas, compresses it, cools it, and then sends it back to a refinery process, where the recovered gas can be used as refinery fuel gas or refinery feedstock.
I-5	ARB	Incorporation of Methane into Air District Rules for Major Industrial Sources to Reduce Fugitive Emissions/Leaks	Under evaluation in collaboration with local air districts	Under evaluation in collaboration with local air districts.	0.01	This regulation proposes to remove existing fugitive methane exemptions from the regulations applicable to equipment and sources employed in California's refineries and other major industrial sources.
N/A	ARB	GHG Reductions from Large Industrial Sources	Board to consider 2014; Implementation TBD	Regulatory development ongoing.	N/A	This measure would require implementation of cost effective, technically feasible measures identified in the industrial energy efficiency audits that would result in reductions of GHG emissions and co-pollutants.
	RECYCLING AND WASTE MANAGEMENT					

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Scoping Plan: Strategy Number or Chapter / Section	Agency[1] and Sector	Name	Implementation Timeline	Activities since last Report Card	Expected GHG Emission Reductions in 2020[2] ($MMTCO_2e$)	Brief Description
RW-1	ARB	Landfill Methane Control Measure (Discrete Early Action)	Approved Jun-2009; Implementation 2010	Implementation ongoing.	1.5	This regulation requires enhanced control of methane emissions from municipal solid waste landfills and requires owners and operators to install gas collection and control systems at smaller and other uncontrolled landfills. Affected landfills are required to implement advanced methane monitoring requirements.
	TRANSPORTATION SECTOR					
T-1	ARB	Pavley I and Advanced Clean Cars	Pavley I: Approved Sep-2004; Implementation 2009-2016 Advanced Clean Cars: Approved Jan- 2012; Implementation 2017-2025	Implementation ongoing.	29.9	On May 19, 2009, the Obama administration announced an agreement to enact national GHG standards for cars and light trucks. This agreement among the U.S. Environmental Protection Agency (EPA), National Highway Transportation Safety Administration (NHTSA), California, and the major auto manufacturers has several key parts. EPA and NHTSA agreed to conduct a joint rulemaking establishing a national GHG and fuel economy standard for 2012 – 2016. California amended its new passenger motor vehicle GHG emission standards for model years 2012-2016 to permit compliance based on federal GHG emission standards. The automakers agreed to drop their lawsuits. EPA granted California the requested waiver. California's program went into effect with the 2009 model year, and all parties agreed to maintain all existing authorities. The Advanced Clean Cars Program will achieve additional GHG reductions from passenger vehicles for model years 2017-2025. This Program represents a new approach to passenger vehicles – cars and light trucks -- by combining the control of smog-causing pollutants and GHG emissions into a single coordinated package of standards known as Low Emission Vehicles (LEV) III. The new approach also includes efforts under the Zero-Emission Vehicle Program to support and accelerate the numbers of plug-in hybrids and zero-emission vehicles in California.
T-2	ARB	Low Carbon Fuel Standard (Discrete Early Action)	Approved Apr-2009; Implementation 2010	Implementation ongoing.	15	This regulation requires fuel providers in California to ensure that the mix of fuel they sell into the CA market meets, on average, a declining standard for GHG emissions measured in CO_2 equivalent grams per energy unit of fuel sold.
T-3	Local Governments / ARB / CalTrans / HCD / OPR / Regional Planning Agencies	Regional Transportation-Related Greenhouse Gas Targets	Approved targets Sep-2010; Implementation is ongoing.	Working with MPOs on Sustainable Communities Strategies.	3.0	ARB set regional passenger vehicle GHG reduction targets to implement SB 375 (Steinberg, Chapter 728, Statues of 2008) in September 2010, developed a methodology to review Metropolitan Planning Organizations (MPO) sustainable communities strategy (SCS) in Jul-2011, and is reviewing MPO SCSs as regions develop them. SB 375 enhances California's ability to reach its AB 32 (Nunez, Chapter 488, Statutes of 2006) goals by promoting effective planning with the goal of more sustainable communities. SB 375 also establishes incentives to encourage implementation of a SCS or alternative planning strategy (APS) to meet the targets. Developers can get relief from certain environmental review requirements under the California Environmental Quality Act (CEQA) if their new residential and mixed-use projects are consistent with a region's SCS (or APS) that meets the target.
T-4	ARB	Tire Pressure Program (Discrete Early Action)	Approved Mar-2009; Implementation Sep-2010	Implementation ongoing.	0.7	This strategy requires specified automobile servicing businesses to ensure proper tire inflation at the time of service, as well as public education about proper tire inflation.
T-5	ARB	Ship Electrification at Ports (Discrete Early Action)	Approved Dec-2007; Implementation 2010	Implementation ongoing.	0.2	This regulation requires most container, passenger, and refrigerated cargo ships to shut off their auxiliary engines while at dock and receive power from the electrical grid, or reduce their emissions by a similar amount via the implementation of other technologies.

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Scoping Plan: Strategy Number or Chapter / Section	Agency[1] and Sector	Name	Implementation Timeline	Activities since last Report Card	Expected GHG Emission Reductions in 2020[2] ($MMTCO_2e$)	Brief Description
T-6	ARB	<u>Goods Movement Efficiency Measures:</u> 1) Port Drayage Trucks	1) Approved Dec-2007; Implementation 2010	Implementation ongoing.	3.5	1) This regulation requires the reduction of GHG, diesel particulate matter (PM), and oxides of nitrogen (Nox) emissions from drayage trucks operating at California's ports and rail yards through retrofits and turnover of pre-1994 trucks.
		2) Transport Refrigeration Units Cold Storage Prohibition.	2) Board to consider TBD; Implementation TBD	Continuing to evaluate.		2) Transport Refrigeration Units (TRUs) are powered by external combustion engines. This measure would limit the amount of time TRU engines could run for extended cold storage at facilities including distribution centers and grocery stores.
		3) Cargo Handling Equipment, Anti-Idling, Hybrid, Electrification	3) Board to consider TBD; Implementation TBD	Continuing to evaluate.		3) ARB will investigate and potentially develop a new measure to restrict unnecessary idling of cargo handling equipment, which would reduce fuel consumption and associated emissions of GHGs, criteria pollutants, and toxic air contaminants.
		4) Goods Movement System-Wide Efficiency Improvements	4) Board to consider TBD; Implementation TBD	Continuing to evaluate.		4) The System-wide Efficiency Improvements measure addresses emissions from marine vessels, trucks, trains and port-support equipment. This measure entails development and implementation of strategies that provide continued progress toward a lower carbon, more sustainable freight transport system.
		5) Commercial Harbor Craft Maintenance and Design Efficiency	5) Board to consider TBD; Implementation TBD	Continuing to evaluate.		5) This measure proposes to facilitate reduction of fuel consumption and associated CO_2 emissions through a variety of technologies and strategies that improve vessel efficiency.
		6) Clean Ships	6) Board to consider TBD; Implementation TBD	Continuing to evaluate.		6) This regulation proposes to require a reduction of fuel consumption and associated CO_2 emissions through a variety of technologies and strategies, such as hull and propeller design in new ships, that improve the efficiency of ocean-going vessels.
		7) Vessel Speed Reduction	7) Board to consider TBD; Implementation TBD	Continuing to evaluate.		7) This measure proposes to primarily require reduction of NOx emissions as well as diesel PM, SOx, and CO_2 emissions resulting from reduced fuel consumption from speed reduction.
T-7	ARB	Heavy-Duty Vehicle GHG Emission Reduction Measure (Aerodynamic Efficiency) (Discrete Early Action)	Adopted Dec-2008; Amended Dec-2010; Implementation 2010-2019.	Implementation ongoing.	0.7	This regulation reduces GHG emissions from tractor-trailer combinations by increasing their fuel efficiency through improvements in aerodynamic drag and tire rolling resistance. It requires 2010 and older model year trucks and trailers to be retrofitted with U.S. EPA SmartWay verified aerodynamic technologies and/or fuel efficient tires and new 2011+ model year tractors and trailers to be U.S. EPA SmartWay certified.
T-8	ARB	Medium- and Heavy-Duty Vehicle Hybridization	Incentive program funding approved annually. Incentive program implementation initiated 2010.	Allocated up to $15M in FY 2013-14 for hybrid and zero-emission trucks from AQIP.	< 0.1	This incentive program reduces the GHG emissions of urban, stop-and-go vehicles, such as parcel delivery trucks and vans, utility trucks, garbage trucks, transit buses, and other vocational work trucks, through the use of hybrid and zero-emission technology. Incentives for hybrid and zero-emission trucks became available starting the first quarter of 2010 and the program will continue into 2014 with up to $15 million in additional funding augmenting the $54 million previously allocated.

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	OTHER SECTORS / STRATEGIES					
Appendix C, Sections 3 and 4	ARB	Cool Communities	Ongoing	Implementation ongoing.	N/A *	This guidance encourages efforts such as light colored pavement, cool roofs and shade trees to decrease the effective temperature of urban areas. These strategies can result in energy savings due to decreased need for air conditioning, leading to decreased GHG emissions associated with energy generation. These efforts also increase albedo, thus reflecting sunlight radiation back to space and resulting in local cooling.
Scoping Plan Chapter IV, Section B	ARB	Small Business Toolkit	Approved Apr-2009; Ongoing	Implementation ongoing.	N/A *	This toolkit provides guidance and informational resources to local businesses on best practices, emission calculation methods, case studies, cost-effectiveness information, and other tools to assist in reducing GHG emissions.
Appendix C, Section 3	ARB	Local Government Toolkit	Approved May-2009; Ongoing	Implementation ongoing.	N/A *	Local governments can use this toolkit to help California meet its AB 32 targets through climate action planning. The toolkit was designed to provide guidance and resources to help cities and counties reduce GHG emissions and save money.
Scoping Plan Chapter II, Section B	ARB	Local Government Operations Protocol	Approved Sep-2008; Ongoing	Implementation ongoing.	N/A *	This protocol provides a standardized set of guidelines to assist local governments in quantifying and reporting GHG emissions associated with their government operations. Allows cities to track their own emissions over time, but is not intended to be used to compare one city's emissions to another city's emissions.
Scoping Plan Chapter II, Section C.1.	ARB	Cap-and-Trade Program	Board Endorsed Dec-2010 with final adoption Oct-2011; Implementation/program launch Jan-2012. First allowance auction held November 14, 2012	ARB is continuing to hold quarterly auctions for allowances. Amendments to the regulation were taken to the Board in October 2013 and cover allocation of allowances, adding a cost containment mechanism, and enhancing oversight. The amendments are expected to go into effect by mid-2014.	23**	The California Cap-and-Trade Program is a market-based approach that provides a firm limit, or "cap," on GHG emissions from the electricity, industrial, commercial, and residential fuels and transportation fuels sectors. The California program may link with other Western Climate Initiative Partner programs to create a regional market system that will achieve greater environmental and economic benefits for the State. Part of the GHG emission reductions under this program are expected to come from the use of offsets (qualified projects outside of sectors under the cap). Offset protocols that are being developed under the Cap-and-Trade Program include: 1) U.S. forest projects; 2) urban forests; 3) livestock manure (digesters); and 4) ozone depleting substances (ODS).
Total Reductions Expected from ARB Led Strategies					**86.8**	

ARB NOTES: * These measures facilitate reductions through voluntary actions.
** Set at a level needed to help achieve the GHG emission reduction target for 2020.
Note: The term "approved" indicates the Board's action at the hearing. This is an interim step in the administrative process; final action by ARB to adopt a regulation occurs after the hearing, and a regulation does not become legally effective under California law until it has been approved by the Office of Administrative Law.

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Scoping Plan: Strategy Number or Chapter / Section	Agency [1] and Sector	Name	Implementation Timeline	Activities since last Report Card	Expected GHG Emission Reductions in 2020[2] ($MMTCO_2e$)	Brief Description
	CAL FIRE / BOARD OF FORESTRY STRATEGIES					
	FOREST SECTOR					
F-1 (Substrategies Below)	CAL FIRE / BOARD OF FORESTRY	Sustainable Forests *	On-going		TBD**	Maintain the current level of carbon sequestration through sustainable management practices including reducing the risk of wildfires, avoiding or mitigating land-use changes that reduce carbon storage, and supporting voluntary actions to conserve biodiversity. Actions to support this strategy are detailed below.
F-1: Substrategy 1	CAL FIRE / BOARD OF FORESTRY	Conservation Forest Management	2005-2020		TBD**	Maintain and enhance forest stocks on timberlands through forest management practices subject to the Forest Practice Act.
F-1: Substrategy 2	CAL FIRE / BOARD OF FORESTRY	Forest Conservation	2005-2020	Three Forest Legacy Program conservation easements transacted to conserve 10,083 acres.	TBD**	Prevent conversion of forestlands through publicly and privately funded acquisitions and easements.
F-1: Substrategy 3	CAL FIRE / BOARD OF FORESTRY	Fuels Management/Biomass	2005-2020	California Forest Improvement Program (CFIP), Vegetation Management Program (VMP), Prop 40 and federal programs funded manual or mechanical fuels reduction on >10,000 acres and prescribed burned > 10,000 acres.	TBD**	Reduce wildfire emissions through fuels reduction on private and federal lands and provide GHG benefits by using woody biomass for biofuels and biopower as fossil fuel alternative.
F-1: Substrategy 4	CAL FIRE / BOARD OF FORESTRY	Urban Forestry	2005-2020	Urban Forestry Program funded tree planting of > 13,000 trees.	TBD**	Plant trees in urban areas to sequester carbon and provide shade to reduce energy use. Urban forest wood waste will also be used for biopower (renewable energy/fossil fuel alternative).
F-1: Substrategy 5	CAL FIRE / BOARD OF FORESTRY	Afforestation/Reforestation	2005-2020	CFIP funded reforestation of 196 acres.	TBD**	Reforest state, private and federal lands to produce sequestration benefits.
	Total Reductions Expected from CAL FIRE Led Strategies				**TBD****	

CAL FIRE NOTES: * CAL FIRE led activities may increase the baseline sequestration potential in future years as funding becomes available for more expansive implementation of the 5 substrategies listed above.

**TBD – Pending improved forest inventory based on California Forest and Rangelands GHG Inventory Development study.

Scoping Plan: Strategy Number or Chapter / Section	Agency[1] and Sector	Name	Implementation Timeline	Activities since last Report Card	Expected GHG Emission Reductions in 2020[2] ($MMTCO_2e$)	Brief Description
	CALRECYCLE STRATEGIES					
	RECYCLING AND WASTE MANAGEMENT					
RW-1	ARB, CalRecycle	Landfill Methane Control Measure (Discrete Early Action)	Approved June-2009 Implementation 2010	CalRecycle continues to work with ARB, other agencies, and external stakeholders as new data and scientific methodologies become available, to ensure that California has the most up-to-date and scientifically accurate estimates of fugitive methane emissions.	1.5 *	This regulation requires enhanced control of methane emissions from municipal solid waste landfills and requires owners and operators to install gas collection and control systems at smaller and other uncontrolled landfills. Affected landfills are required to implement advanced methane monitoring requirements.
RW-2	CalRecycle	Increasing the Efficiency of Landfill Methane Capture	Ongoing	CalRecycle continues to pursue strategies to reduce landfill methane emissions above and beyond what is required under RW-1. CalRecycle and ARB are working with scientists from Jet Propulsion Labs and NASA to develop a method to quantify methane fluxes. CalRecycle updated compilation of site-specific California landfill data intended to support research and statewide inventories relating to bioenergy, climate change, landfill design, and environmental performance.	TBD	Per the Statewide GHG emissions inventory, the largest emissions from the Recycling and Waste Management sector come from landfills and are in the form of methane, which is produced when materials placed in landfills decompose over time. Often, decades elapse and methane is still produced from this decomposition. Although methane is captured currently at many large landfill sites, there are still active landfill operations and closed landfill sites that continue to emit methane that could be captured. In addition, methane capture can also reduce air quality impacts by capturing and destroying volatile organic compounds and other landfill gases that are emitted during the decomposition process.
RW-3 (Sub strategies listed below)	CalRecycle	Zero Waste - High Recycling	Ongoing		Reductions detailed below	Detailed description of related measures below.
RW-3: Sub strategy 1	CalRecycle	Anaerobic Digestion	Full implementation by 2020	CalRecycle continues to participate in the implementation of the 2012 Bioenergy Action Plan, which contains more than 50 recommended actions to increase the sustainable use of organic waste, expand research and development of bioenergy facilities, reduce permitting and regulatory challenges, and address economic barriers to bioenergy development. In partnership with ARB, CalRecycle is developing additional Low Carbon Fuel Standard pathways. CalRecycle is providing ongoing technical support to a number of the Anaerobic Digestion (AD) projects that are under development. CalRecycle collaborates with the California Energy Commission to provide technical support for AD project development under the Alternative and Renewable Fuel and Vehicle Technology program and technology development under Public Interest Energy Research program. CalRecycle provides technical and permitting support to jurisdictions and stakeholders deploying AD projects in California. CalRecycle is developing in-vessel digestion regulations which will address all types of in-vessel digestion activities, including anaerobic digestion. CalRecycle participated in the California/Federal Dairy Digester Working Group to encourage the development of anaerobic digesters at dairies.	2.0 **	Anaerobic digestion (AD) uses engineered in-vessel systems to accelerate the decomposition of organic materials to produce biogas production, soil amendments and reduce waste. Diverting organic waste from landfills to beneficial use provides significant reduction of GHG emissions through landfill methane avoidance. This strategy will also result in substantial renewable energy production that will aid in the 33 percent Renewable Portfolio Standards goal and compliance with the Low Carbon Fuel Standard. Additionally, AD provides employment opportunities and other co-benefits to the communities where the facilities are located.
RW-3: Sub strategy 2	CalRecycle	Mandatory Commercial Recycling Regulation	Approved May-2012 Full implementation by 2020	To facilitate the implementation of the Mandatory Commercial Recycling (MCR) regulation on July 1, 2012, staff have worked with each jurisdiction to develop specific strategies for providing education, outreach, and monitoring to businesses and multifamily complexes. Staff also have provided assistance to each jurisdiction in reporting its progress in implementing the first six months of related education, outreach and monitoring for MCR in CalRecycle's Electronic Annual Report. Additionally, staff continue to promote the use of a climate calculator designed for California businesses and multifamily complexes to assess the financial, climate change, and waste reduction/environmental benefits of reducing and recycling their discarded materials. As part of a 2014-15 waste characterization study, CalRecycle will include analysis to determine the initial effectiveness of the MCR regulation.	5.0 **	The commercial recycling measure focuses on increased commercial waste diversion. Commercial businesses in California generate roughly 75 percent of the statewide solid waste. Reductions in GHG emissions can be realized from solid waste management by recovering traditional recyclable materials from the commercial waste stream with the goal to remanufacture these materials, thus reducing the GHG emissions from multiple phases of product production including extraction of raw materials, preprocessing and manufacturing. Traditional recyclable materials have significant intrinsic energy value that displaces fossil fuel energy requirements when introduced back into the manufacturing cycle. Benefits from the commercial recycling measure include avoided methane emissions from landfill disposal by recycling any organic materials from the waste stream.

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Scoping Plan: Strategy Number or Chapter / Section	Agency[1] and Sector	Name	Implementation Timeline	Activities since last Report Card	Expected GHG Emission Reductions in 2020[2] ($MMTCO_2e$)	Brief Description
RW-3: Sub strategy 3***	CalRecycle	Extended Producer Responsibility (EPR)	Full implementation by 2020	*These laws follow producer responsibility principles to ensure programs that are sustainably funded and properly manage leftover or discarded products generated in California .* **Carpet**: California's Carpet Stewardship Program started July 1, 2011. As of Q2, 2013, the program has processed carpet resulting in 71 million pounds of carpet material (primarily nylon) that has been resold for use in new products. While there are quarter to quarter changes in collection and processing, the general trend is gradually upward. Two processors shutdown in California in 2013. More carpet is made with non-nylon materials and for the long term viability of recycling, these non-nylon materials must become recyclable and supported with viable markets. Carpet America Recovery Effort (CARE) is updating their conditionally approved Plan to address changing market conditions. **Paint**: California's Architectural Paint Stewardship Program started on October 19, 2012. CalRecycle continues to monitor PaintCare's progress in establishing convenient postconsumer architectural paint collection sites statewide and educating households, painting contractors, and businesses on how to reduce, reuse, and recycle postconsumer paint in California. From October 19, 2012 to June 30, 2013, almost 500 postconsumer paint collection sites were established statewide and 632,652 gallons of postconsumer paint were processed through the paint stewardship program. **Mattresses**: On September 27, 2013 Governor Brown signed the Used Mattress Recycling and Recovery Act, a law requiring mattress manufacturers and renovators to design, finance, and implement a program to collect and properly manage used mattresses in California. CalRecycle will promulgate emergency regulations in preparation for submittal of the stewardship plan(s) by July 1, 2015.	TBD	Extended producer responsibility (EPR) places shared responsibility on producers and all entities a product life cycle for reducing health and environmental impacts that result from supply chain, production, use, and end-of-life management. A major component includes product design changes that minimize negative impacts. By implementing extended producer responsibility, GHG emission reductions can be realized from avoided energy use in the extraction of resources. AB 1343 (Huffman, Chapter 420, Statutes of 2010), the Paint Recovery Act, and AB 2398 (Perez, Chapter 2398, Statutes of 2010), Product Stewardship for Carpet, were signed into law September 2010. SB 254 (Hancock, Chapter 338, Statutes of 2013), the Used Mattress Recycling and Recovery Act, was signed into law on September 2013.
RW-3: Sub strategy 4	CalRecycle	Increase Production & Markets for Compost	Full implementation by 2020	CalRecycle continued support of several research projects related to compost production and markets including: research on GHG emissions from compost piles and N_2O emissions reduction potential of finished compost application on agricultural land; demonstration of reduced GHG emissions from solar-powered aerated static compost pile project with San Joaquin Valley Technology Advancement Program; and initiation of direct land application of green waste GHG emissions study with UC Davis. CalRecycle conducted several informal workshops to review draft regulatory issues and potential approaches for future revisions to Title 14 and Title 27 regulations regarding compostable materials, transfer/processing, permit application form, and permit exemptions. Other efforts include collaborating with the State Water Resources Control Board and Regional Water Boards on a statewide Order for compost facilities to implement water quality protection measures; working with the Air Resources Board and local Air Districts to address emissions related to compost facilities; identifying and addressing pesticides of concern to compost with the Department of Pesticide Regulation; working with USEPA to promote the "Food Recovery Challenge" that is encouraging programs to help reduce food waste; and continuing to work with Caltrans on compost/mulch specification development and increasing product use.	2.0 **	CalRecycle continues efforts to divert organic materials from landfills by increasing the production of and markets for compost, mulch, and biofuels/energy. Organic materials diversion from landfill disposal can provide a significant GHG reduction through landfill methane avoidance. When compost and mulch products are applied to soils, including agricultural crop lands, additional GHG emission reductions may be achieved through reduced water consumption, resulting in energy savings in pumping irrigation water. Additional GHG benefits can be realized through reduced manufacturing and transport of fossil-fuel-derived fertilizers, and reduced off-gassing of those fertilizers once applied to agricultural land. CalRecycle's efforts to increase the production and markets for compost include compost-based best management practices; development of compost specifications for agriculture; and research covering a range of composting uses. Ongoing CalRecycle research will help clarify GHG emissions from compost production and compost use in agriculture, including compost impacts on agricultural N_2O emissions.
Appendix C, Section 9. C.	CalRecycle	Liquefied Natural Gas from Landfill Gas Measure	Full implementation by 2020	High Mountain Fuels received "Alternative and Renewable Fuel and Vehicle Technology Program" (AB 118) funds for the development of new liquefied natural gas (LNG) production plant at Simi Valley Landfill; project to produce 6 million gallons of renewable bio-LNG per year. The Solid Waste Facility Permit for Simi Valley Landfill was issued on April 3, 2012.	1.0	This activity implements grant-funded projects at two landfills to demonstrate commercial scale technologies for converting landfill gas to LNG vehicle fuel. Recovery of landfill methane that is combusted through flaring can be captured as a biomass renewable energy source. Executive order S-06-06 directs State agencies participating in the Bio-energy Interagency Working Group to enhance the sustainable management and development of biomass resources for electricity generation and production of alternative fuels (bio-fuels). However, substantial financial and technical barriers exist for in-state production of LNG from landfill gas. The technology transfer from these commercial projects could provide significant GHG reduction opportunities.

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Not in Scoping Plan	CalRecycle	Achieved 50 Percent Statewide Recycling Goal (Accomplished prior to Scoping Plan development)	Ongoing****	CalRecycle provides assistance to local jurisdictions, businesses and the public with their recycling efforts. In 2012, a per-resident disposal rate of 4.3 pounds/resident/day was calculated using SB 1016's measurement system; however, the per-resident "diversion rate equivalent" remains unchanged at 65 percent.	3 [5]	Increasing the amount of solid waste that is recycled, reused, or composted will reduce GHG emissions primarily by: 1) reducing the energy requirements associated with the extraction, harvest, and processing of raw materials; and 2) using recyclable materials that require less energy than raw materials to manufacture finished products. Increased diversion of organic materials (green and food waste) will also reduce GHG emissions by redirecting this material to processes that use the solid waste material to produce vehicle fuels, heat, electricity, or compost. *[**NOTE**: The 3 $MMTCO_2e$ figure for this strategy reflects the GHG reduction at the 54 percent level for recycled materials]*
Not in Scoping Plan	CalRecycle, CEC, ARB, CPUC	Waste Technology Demonstration & Development	Full implementation by 2020	A Recycling Market Development Zones loan to Clean World Partners was approved in 2012 for $2 million to finance equipment for a new anaerobic digestion (AD) facility. CleanWorld officially broke ground in June 2013 to expand the 10,000 tons per year facility by 300 percent to 40,000 tons per year making it the largest commercial high-solids food waste digester in the United States. Upon completion in December 2013, the Sacramento BioDigester will convert 100 tons per day of food waste into renewable energy in the forms of heat, electricity, natural gas, and fertilizer enhancements.	TBD	This measure will aid in the development of new technologies to reduce GHGs by providing necessary funding that will assist developers in demonstrating their technology on a commercial scale. Of particular interest is development of technologies that produce renewable energy from municipal solid waste. CalRecycle, through its Recycling Market Development Zones, continued to provide low interest loans and technical and permitting assistance to eligible biofuel and renewable electricity projects that utilize municipal solid waste.
Not in Scoping Plan	CalRecycle,	AB 341 – California's 75 Percent Recycling Initiative	Full implementation by 2020	CalRecycle continues to conduct workshops and meetings to obtain public input and is also preparing a report to the Legislature, due January 1, 2014, detailing strategies to achieve the policy goal for California that not less than 75 percent of the solid waste generated be source-reduced, recycled or composted by 2020.	TBD	Signed by the Governor in October 2011, AB 341 (Chesbro, Chapter 476, Staatutes of 2011) set an ambitious 75 percent statewide recycling goal of California's solid waste by 2020 which means that roughly 20 million tons per year of materials currently disposed in landfills will be recycled resulting in significant GHG reductions.
	WATER SECTOR					
Appendix C, Section 4.E.	CalRecycle, DWR	Watershed Friendly Landscape Guidelines	Full implementation by 2020	As part of the River Friendly Landscape Coalition (RFL), a collaboration between public agencies, non-profit organizations, designers, private landscape architects, and contractors in the Greater Sacramento Region, CalRecycle meets on a monthly basis with a network of landscape professionals and alliances to collaborate and identify how to help fulfill outreach, education and training needs with emphasis on topics that include RFL menu of best practices (seven principles). CalRecycle participates in the EcoLandscape conferences held biennially and is preparing for the next EcoLandscape conference to be held February 1, 2014.	TBD	These adopted guidelines will help protect watersheds through the use of sustainable landscaping practices, as well as reduce GHG emissions related to transporting green material to landfills and the generation of methane from the green materials deposited in landfills. The guidelines will also address fossil fuel consumption from landscape power equipment and chemical fertilizers, and GHG emissions related to water treatment and distribution. Outreach efforts continue.
Total Reductions Expected from CalRecycle Led Strategies					**10*****	

CalRecycle NOTES: * Reduction included under ARB's totals (see page 3)

** GHG emission reduction estimate in Scoping Plan

*** Split responsibility for Substrategy 3: CalRecycle is lead for EPR, and DGS is lead for EPP.

****Achieved 52 percent in 2005, 54 percent in 2006, 58 percent in 2007 , 59 percent in 2008, 65 percent in 2009, 65 percent in 2010, 65 percent in 2011, 65 percent in 2012.

***** The total includes RW 3-Substrategy 1 (Anaerobic Digestion), RW 3-Substrategy 2 (Mandatory Commercial Recycling), RW-3 Substrategy 4 (Increase Production & Markets for Compost), and Appendix C. Section 9. C (Liquified Natural Gas). The total does not include RW 1 (Landfill Methane Control Measure) because its reduction is included under ARB's reductions. Also total does not include "Achieve 50 Percent Statewide Recycling Goal" because it pre-dates the Scoping Plan.

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	CALTRANS STRATEGIES					
	TRANSPORTATION SECTOR					
Not in Scoping Plan	CalTrans	Alternative Employee Commuting Strategies	2020	On-going. GHG emission reductions were approximately 6,000 $MTCO_2$.	0.007	Caltrans has many employee commute programs in place that reduce the need to drive to work. These include monthly bus passes, emergency ride home vouchers, subsidies for vanpools, carpool matching services, and secure-access bicycle parking
Not in Scoping Plan	CalTrans	Fleet Greening and Fuel Diversification	2020	The Caltrans Fleet Greening Program began as a five-year plan in August 2000 to reduce emissions from the Caltrans fleet, stay ahead of emerging regulations, and set the example for the use of emerging, clean air technologies. Today the Director's policy continues to promote an efficient fleet mix and use of efficient, low emission vehicles to lower Caltrans' use of petroleum as well as reduce emissions of criteria air pollutants and greenhouse gases. Through a combination of regulation compliance, state purchasing policies, and innovative demonstrations we've implemented, for example, hybrid passenger vehicles, solar-powered equipment, propane-fueled vehicles, low dust street sweepers, diesel particulate filters on heavy-duty, diesel-powered vehicles, two hydrogen demonstration vehicles, and an E-85 fuel ethanol demonstration project.	0.1	Fleet replacement
Not in Scoping Plan	CalTrans	Non-Vehicular Conservation Measures	2020	These activities include: district facility energy conservation projects coming on line; bridge light-emitting diode (LED) roadway lighting system upgrades; LED roadway lighting increased at intersections & on ramps; anda full statewide deployment of the Computer Energy Reduction and Data (CERB) collection project.	0.14	Energy Conservation Opportunities
	INDUSTRY SECTOR					
Not in Scoping Plan	CalTrans	Alternative Asphalt Strategies	On-going	NA	0.06	Caltrans use of alternatives to hot mix asphalt reduces its operational GHG emissions
Not in Scoping Plan	CalTrans	Alternative Cement and Concrete Strategies **	On-going		0.2	This strategy reflects Caltrans cement consumption only. The measure includes both the 2.5 percent limestone cement mix and up to 25 percent fly ash. It is also expected that given the new Caltrans' cement standards, the GHG emission savings could be reflected in the statewide cement consumption as well. However, that saving is not shown here. Starting in 2009, new Caltrans cement standards will reflect 5 percent limestone and up to 50 percent fly ash which is expected to improve the CO_2 emission savings correspondingly. The Scoping Plan has identified the Cement Sector as falling under Cap & Trade.
	OTHER					
Not in Scoping Plan	CalTrans	Facility Efficiency and Energy Conservation	On-going	NA	0.022	Caltrans has improved the energy efficiency of existing Caltrans buildings and has constructed new facilities that meet LEED standards. Several of the most widely-deployed strategies to reduce GHG emissions at Caltrans administrative facilities, include: LEED certified buildings, Data center upgrades, Energy efficient lighting, Low flow toilets and water fixtures, Other energy efficiency upgrades and retrofits.
Total Reductions Expected from CalTrans Led Strategies					**0.5**	

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	CALIFORNIA DEPARTMENT OF FOOD AND AGRICULTURE (CDFA) STRATEGIES *					
	AGRICULTURAL SECTOR					
A-1	CDFA, ARB	Methane Capture at Large Dairies (Enteric Fermentation, Dairy Digesters)	TBD	CDFA along with U.S. Department of Agriculture Natural Resources Conservation Service and U.S. Environmental Protection Agency have created the CA/Fed Dairy Digester Working Group. The group consists of staff from ARB, CDFA, CalEPA and dairy stakeholders. The group has devoloped a Request for Proposals; a joint solicitation for dairy digester concept proposals. The goal of the proposals are to facilitate further implementation of dairy digesters in California; http://www.cdfa.ca.gov/egov/Press_Releases/Press_Release.asp?PRnum=13-026 The Group has devoloped a statement of principals and recommendations document; http://www.cdfa.ca.gov/EnvironmentalStewardship/pdfs/StatemntOfPrinciples-CA-FederalDairyDigesterWorkGroup.pdf	TBD	These activities have been initiated in coordination with the ARB. The State and Federal Agencies continue to work on addressing regulatory, (including permitting), technical and financial barriers to a widespread voluntary adoption of anaerobic digesters on dairies. CDFA organized the Dairy Digester Working Group to address some of the pending issues. More information about implementation of this measure and the protocol for measuring compliance can be found in the 'Agricultural Sector' listing on the ARB section of this document.
Early Action Item	CDFA, ARB, CEC	Agricultural Research - Nitrous Oxide Reduction	Ongoing	Research, through funding from CDFA, continues on corn, tomatoes, and cotton crops. Research on tomatoes and cotton is expected to be completed in 2013. Corn research will be completed in 2014. CDFA funded research is nearing completion for cotton. Emission factors are being devoloped to determine the amont of nitrous oxide emitted under different nitrogen fertilizer application rates and compared to natural background nitrous oxide emission results. Corn studies are ongoing. The tomato studies have been completed as part of ARB funded projects.	N/A [4]	CDFA has engaged in efforts with ARB and CEC during the past several year to coordinate research activities on reducing nitrous oxide emissions from nitrogen fertilizer applications. CDFA committed to funding $150,000 on baseline agricultural nitrous oxide emissions. CDFA funded research on this topic will continue though 2014.
Not in Scoping Plan	CDFA	Hydrogen Fuel Quality and Quantity	Ongoing	Interim standards developed by the Division of Measurement Standards (DMS) served as the model for the SAE standard, which CDFA has adopted via rulemaking. DMS was also integral in developing a national standard for hydrogen dispenser specifications and accuracy tolerances. CDFA has begun rulemaking to amend the national model standard for use in California. Under a grant from the California Energy Commission, DMS is developing sampling techniques and analytical test methods to determine the quality of hydrogen dispensed at fueling stations. Also included in the grant is research to determine the most appropriate hydrogen dispenser methods. CDFA-DMS is an active participant with the Governor's Office Zero Emission Vehicle (ZEV) Interagency Work Group, and CDFA-DMS is identified as lead agency responsible for the legal sale of hydrogen at retail. CDFA – DMS has begun rulemaking to temporarily widen the accuracy tolerances for hydrogen dispenser which will facilitate the sale of hydrogen at retail.	TBD *	CDFA – Division of Measurement Standards has played a central role in the establishment of a national standard under SAE International for Hydrogen used in fuel cell vehicles.
Not in Scoping Plan	CDFA	Biodiesel Blends Renewable Diesel	Ongoing	Active partner in ongoing development of national standards	TBD *	CDFA-DMS is an active partner in ongoing development of national standards under ASTM International for biodiesel, renewable diesel fuels, and diesel substitutes such as dimethyl ether. Under a grant from the California Energy Commission, DMS is researching test methods needed for the development of a greater than 20 percent biodiesel blend standard.
Not in Scoping Plan	CDFA	Ethanol Flex Fuel, Gasoline-Ethanol Blends, and other alcohols	Ongoing	DMS is participating with ASTM International in the development of national standards for butanol based fuel. Regulations are in place to permit the sale of Bio-butanol and other Bio-alcohols fuels as these products are brought into the market. The California Type Approval Program has established clear guidelines for approval of any new alternative fuel metering devices.	TBD *	CDFA-DMS promotes the use of Ethanol based fuels by the establishment of specifications and regulations which allow the sale of Ethanol Flex Fuel and higher Gasoline Ethanol blends.
Not in Scoping Plan	CDFA	Developmental Fuels	Ongoing	DMS is actively working with the California Air Resource Board to identify new fuels that meet California's goals of lower fossil carbon emissions, reduced air pollution, energy independence, and increased use in renewable fuels. Theses fuel will provide California agriculture new opportunities to develop crops for alternative fuels and even greater opportunity for transforming agriculture waste into green fuel.	TBD *	CDFA developmental engine fuel variance program allows alternative fuels that currently have no National Standard to be used in limited applications for the purpose of developing a National Standard.
Not in Scoping Plan	CDFA, CEC	Energy Crops	Final report due August, 2013	Coordinate with the CEC on research. Research has been completed. Final report will be available shortly.	TBD	Coordinate with the CEC on research to demonstrate potential energy and industrial crops under commercial conditions; familiarize growers with these crops; focus on crops that use marginal lands and that minimize environmental externalities; determine the suitability of these crops for various energy markets; determine costs and energy balance of production; and, identify barriers to commercialization.

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Not in Scoping Plan	CDFA	Specialty Crop Block Grants	Ongoing	Several research projects related to GHG reductions were funded under the 2012 Specialty Crop Block Grant Program (SCBGP).	TBD	Several research projects related to GHG reductions were funded under the 2012 SCBGP. The results of the funded research projects are expected to have a direct impact on the current understanding of GHG from agriculture and potential offset strategies. This research is critical to addressing knowledge gaps in GHG emissions for California specialty crops. More information on this and other funded projects can be found at www.cdfa.ca.gov/grants.
Total Reductions Expected from CDFA Led Strategies						

CDFA NOTES: * CDFA has important programmatic responsibilities that in themselves do not result in emission reductions, however they are an important and necessary piece of the efforts that will result in reductions in other sectors.

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	CALIFORNIA ENERGY COMMISSION (CEC) STRATEGIES					
	ELECTRICAL AND NATURAL GAS SECTOR					
E-1	CEC	Comprehensive Publicly Owned Utilities Efficiency Program	Ongoing	The CEC worked with the publicly owned utilities (POUs) to make the revised efficiency evaluation, measurement, and verification handbook more useful with the expectation that energy savings estimates will be more reliable. This handbook is expected to be complete by the end of 2013.	1.7 *	The POUs should use the revised handbook in their next EM&V cycle to improve and verify energy efficiency savings.
E-1	CEC	Building Energy Efficiency Standards in Place	Ongoing	Published the Building Energy Efficiency Standards update in 2013. These standards will be effective January 1, 2014. Work closely with the CPUC and other stakeholders on strategies to achieve "zero net energy" buildings. Continue programs that support education and workforce training related to energy efficiency.	4.5 **	Develop energy efficiency requirements for newly constructed buildings, building additions and alterations (Title 24, Part 6); the building standards adopted in 2012 will become effective in 2014. Planning has begun for the 2016 update to building energy efficiency standards.
E-1	CEC	Appliance Energy Efficiency Standards in Place	Ongoing	Appliance efficiency standards for small consumer battery chargers effective February 2013 and large consumers January 2014. The Energy commission has begun pre-rulemaking activities on standards for: set-top boxes, computers, monitors/displays, toilets/urinals, faucets, pool pumps, small network devices, light-emitting diodes (LED), small diameter lamps, dimmable ballasts, game consoles. Also pre-rulemaking began for appliance standards enforcement.	6.3 **	Develop energy efficiency requirements for appliances sold in California (Title 20); recent appliance standards include: metal halide lamps, portable lights, pool pumps, televisions (<58 inches), and certain incandescent lamps. Standards are being developed for: set-top boxes, computers, monitors/displays, toilets/urinals, faucets, additional pool pumps, small network devices, LED and small diameter lamps, dimmable ballasts, and game consoles.
	TRANSPORTATION SECTOR					
T-4	CEC	Fuel-Efficient Tire Program	Ongoing	Continued research in coordination with the National Highway Traffic Safety Administration on tire efficiency metrics.	TBD ***	Depending upon timing of federal action with fuel efficiency of replacement tires, the Energy Commission may adopt and implement a state program in 2014 or 2015. Reducing the average rolling resistance of replacement tires through consumer information and minimum standards promises fuel savings and a resultant reduction in GHG emissions.
	WATER SECTOR					
W-3	CEC, DWR, CPUC, SWRCB	Energy Intensity of the Water System	Ongoing		2 [3]	The Commission has a current investigation into water conservation and subsequent energy conservation
W-5	CEC, DWR, CPUC, SWRCB	Increase Renewable Energy Production from Water	Ongoing		0.9 [3]	The purpose of this measure is to identify and implement specific projects that take advantage of the State's water system-related opportunities to generate renewable electricity. Examples: water moving through conduits, sunlight, wind, and gases emitted during treatment of wastewater at wastewater treatment plants.
Total Reductions Expected from CEC Led Strategies					**4.6******	

CEC NOTES: * Estimate of POU EE Program energy savings is based upon a 2013 status report to the Legislature; average of most recent 5 years is used to project savings through 2020. The Energy Commission and POUs are working to develop a standardized approach to evaluation and verification of efficiency program savings estimates.

** Building and appliance standards pre-date the Scoping Plan and are not included in AB32 reduction totals, but shown here to document on-going efforts. Savings based on CA Energy Demand (CED 2013) revised mid-case forecast and 588 $lbsCO_2$/MWh for avoided electricity consumption.

*** NHTSA (US DOT) may propose a tire fuel efficiency program in March 2014 and adopt it Fall 2014. State tire efficiency program will focus on consumer education and standards for replacement tires.

**** The strategies that contributes to this total are E-1 (Comprehensive Publicly Owned Utilities Effieciency Program), W-3 (Energy Intensity of the Water System) and W-5 (Increase Renewable Energy Production from Water).

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	CALIFORNIA PUBLIC UTILITIES COMMISSION (CPUC) STRATEGIES *					
	ELECTRICAL AND NATURAL GAS SECTOR					
E-1	CPUC	IOU Energy Efficiency Programs	Ongoing through 2020	2013-14 energy efficiency (EE) application decision adopted in Nov 2012; New EE Order Instituting Rulemaking initiated (Nov 2013); EE finance decision adopted (Sept 2013); Energy Savings Performance Incentive (ESPI) decision adopted (August, 2013); demand-side measure (DSM) Statewide Marketing, Education and Outreach proposed decision released (Nov 2013); EE Community Choice Aggregator Administration proposed decision released (Oct 2013); New EE Statistics website launched (Nov 2013); Collaboration with Energy Commission on AB 758 Action Plan (draft released in May); Collaboration with Energy Commission on adopting Zero Net Energy Code Building definition (draft released Oct 2013 for Jan 2014 adoption); Collaboration with Energy Commission on Proposition 39 Program Guidelines (draft released Sep 2013); Joint Agency (CPUC-CEC) Research and Technologies Action Plan launched (summer 2013); Completed 2013-14 EE Evaluation Road Map and launched evaluation activities; Launched Database of Energy Efficiency Resources update process for 2013 and 2014.	11.7	Reflects EE program reductions in investor-owned utility (IOU) territories not included in the CEC standards measures above. Based on the 2008 Itron High Goals Scenario and EE reductions based on the Commission's Long Term Energy Efficiency Strategic Plan, including four "Big Bold strategies": 1) All new residential construction in California will be zero net energy by 2020; 2) All new commercial construction in California will be zero net energy by 2030; 3) Heating, ventilation, and air conditioning (HVAC) industry will be reshaped to ensure optimal equipment performance; 4) All eligible low-income homes will be energy-efficient by 2020.
E-2	CPUC, CEC	Customer-Installed Combined Heat and Power systems (non SGIP)	2008-2020	CPUC continued implementation of the comprehensive Qualifying Facility and Combined Heat and Power (CHP) Settlement, effective November 2011. As of October 2013 the utilities have completed their first CHP-only competitive solicitations and have executed contracts for 1,700 MW of CHP Settlement-eligible facilities, resulting in 1.6 MMT of GHG emission reduction credit (according to the Settlement's accounting rules). The CPUC is currently overseeing the utilities' second round of CHP-only solicitations, which will complete in late 2013/early 2014.	4.8	In December 2010, the CPUC approved a comprehensive CHP program with several procurement options for CHP facilities. This program establishes a requirement that the utilities procure 3,000 MW of CHP by November 2015 and achieve 4.8 MMT of GHG emission reductions by 2020. This GHG target is the proportional share of the ARB Scoping Plan GHG emissions reduction target from CHP facilities within the CPUC's jurisdiction. Emissions reductions from the CPUC's CHP Program are calculated based on accounting methodologies defined the Commission's QF/CHP Program Settlement. Additionally, the Commission is implementing a CHP Feed-in-Tariff program for highly-efficient CHP facilities 20MW in capacity and smaller, pursuant to AB 1613 (Blakeslee, Chapter 713, Statutes of 2007).
E-2	CPUC	Electricity Sector Carbon Policy	Began in 2007 (emissions performance standard)		N/A **	The Emissions Performance Standard (EPS) ensures that baseload generation used to serve California consumers is from power plants that have an emissions intensity no greater than a combined cycle gas turbine plant.
E-3	CPUC, CEC	33 Percent RPS	Ongoing -- legislative target was modified by SB2(1x) to 33 percentrenewable energy by 2020	CPUC is implementing SB 2 (1x) (Simitian, Chapter 1, Statutes of 2011-12 First Extraordinary Session), which codified the 33 percent RPS mandate (CPUC Proceeding R.11-05-005). A proposed decision was issued to authorize the next RPS solicitations for the three large utilities. Four Renewable Auction Mechanism (RAM) auctions (<20 MW facilities) have been conducted and a 5th will be held before June 2014. Utility solar photovoltaic programs were authorized to procure 742 MW of new solar PV capacity over five years. The RPS Feed-in-Tariff (FIT) was also revised to use the Renewable Market Adjusting Tariff (ReMAT). It will target renewable distributed generation up to 3 MW in capacity, with the first contracts to be executed in November 2013. The CPUC is also implementing a 250 MW set-aside for small-scale bioenergy projects, pursuant to SB 1122 (Rubio, Chapter 612, Statutes of 2012).	19.3	The RPS program establishes a minimum amount of renewable energy the IOUs and POUs must procure from renewable sources to serve their retail customers by 2020. In 2012, approximately 20 percent of the three large IOUs' energy deliveries were from renewable resources. The "Expected GHG Emission Reductions in 2020" value shown here reflects the total anticipated annual avoided GHG emissions resulting from all renewable capacity installed pursuant to the RPS program since 2007.
E-4	CPUC, CEC	Senate Bill 1 - GoSolarCalifornia (previously titled - 'Million Solar Roofs')	Program began in 2007; projected completion by 2016	In 2012, the CPUC portion of GoSolarCalifornia, known as the California Solar Initiative (CSI), installed 391 MW. This brings the cumulative total through November 1st, 2013 to 1,869 MW installed on 190k customer sites.	2.2	The goal of GoSolarCalifornia is to facilitate the deployment of 3,000 MW of rooftop solar via provision of rebates to help buy-down the up front cost of rooftop solar PV on residential and commercial buildings. The CPUC is responsible for 1,940 MW of retro-fit projects.
CR-1	CPUC, CEC	Energy Efficiency: 800 mil. therms reduced consumption.	TBD	See above (E-1) for IOU EE program activities overseen by the CPUC.	4.3	This strategy includes: utility energy efficiency programs; building and appliance standards; and additional efficiency and conservation programs.
CR-2	CPUC	Increased Use of Solar Water Heating	TBD	In Fall 2011, the CSI-Thermal Program began providing incentives for solar water heating systems that displace propane. In March 2012, the CSI-Thermal Low-Income program began accepting applications for natural gas-displacing solar water heating systems on single and multi-family affordable housing residences..	0.1	In January 2010, the PUC approved the California Solar Initiative (CSI) Thermal Program , which provides up-front incentives toward the purchase of solar water heaters and other solar thermal technologies in the territories for customers electric and gas investor-owned utilities in California. Within the IOU service territories, this program provides customer rebates to support the deployment of gas displacing solar water heating systems on homes and businesses sufficient to displace 585 million therms (equivalent to 200,000 single-family residential systems) as well as support the deployment of electric displacing systems to displace 276 million kWh (equivalent to 100,800 single-family residential systems).

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Scoping Plan: Strategy Number or Chapter / Section	Agency[1] and Sector	Name	Implementation Timeline	Activities since last Report Card	Expected GHG Emission Reductions in 2020[2] ($MMTCO_2e$)	Brief Description
Not in Scoping Plan	CPUC	Self Generation Incentive Program	Began in 2001; ongoing	Pursuant to SB 412 (Kehoe, Chapter 182, Statutes of 2009), in 2011, the CPUC issued a decision modifying the program to focus more specifically on technologies that provide for net GHG emission reductions. The revamped SGIP program began accepting applications in the first half of 2012.	TBD	Within the IOU service territories, this program provides customer rebates to support the deployment of clean customer side generation including wind and fuel cells. Pursuant to SB 412, in 2011, the CPUC issued a decision modifying the program to focus more specifically on technologies that provide for net GHG emission reductions.
Scoping Plan Chapter II, Section C.1.	ARB, CPUC	Cap-and-Trade Program	Began November 2012; ongoing	The CPUC is continuing implementation of the Cap and Trade Program (Rulemaking R.11-03-012). Staff issued proposed methods to return GHG allowance revenue for industrial assistance; the CPUC issued proposed decisions on small business assistance and utility implementation plans. The CPUC opened a new proceeding to approve utility GHG cost and revenue forecasts to include in 2014 rates. Additionally, the CPUC continued oversight of utility procurement of GHG compliance instruments.	Reduction included in ARB totals.	The California cap-and-trade program is a market-based approach that will provide a firm limit, or "cap," on GHG emissions from the electricity, industrial, commercial, and residential fuels and transportation fuels sectors. The Commission's role in the cap-and-trade program is to determine appropriate uses of the revenue utilities will receive from participation in the program. Additionally, the Commission reviews and approves the utilities' procurement strategies to comply with the cap-and-trade program.
Not in Scoping Plan	CPUC, Calrecycle, ARB	Renewable Auction Mechanism for system-side renewable distributed generation	Began 2008	The Commission has overseen four RAM auctions for facilities between 3MW and 20MW in acapacity. A 5th and final RAM auction was authorized to take place no later than June 2014 for the utilities to subscribe any remaining capacity from the 1,330 MW authorized by the Commission. (See Strategy E-2 above for additional RAM activities.)	Is included in goal for 33 percent RPS	The Renewable Auction Mechanism (RAM) is a simplified, market-based procurement mechanism for renewable distributed generation (DG) projects up to 20 MW on the system side of the meter. The Commission adopted RAM as the primary procurement tool for system-side renewable DG to promote competition, elicit the lowest costs for ratepayers, encourage the development of resources that can utilize existing transmission and distribution infrastructure, and contribute to RPS goals in the near term. To begin the program, the Commission authorized the utilities to procure 1,000 megawatts through RAM. Going forward, the capacity authorization will reflect each utility's need for system-side DG under 20 MW.
Not In Scoping Plan	CPUC	Alternative Fuel Vehicles (Natural Gas and Electric Vehicles)	Rulemaking began in 2009;	In April 2012, the Governor's Office released an Executive Order setting a state target of having 1.5 million plug-in electric vehicles (PEVs) on the roads by 2025. To support this target, CA agencies and stakeholders developed an action plan document to support the state reaching this goal. CPUC will support the state target by evaluating electric vehicle rates offered by utilities, developing a submetering protocol to support customer choice in metering options, identifying barriers that prevent vehicles from integrating into the grid, and conducting load reserach to understand charging behavior and the need for public/workplace charging stations. Additionally, the Commission settled a Energy Crisis-era lawsuit with NRG to provide $100 million in electric vehicle infrastructure in California.	TBD	The CPUC launched an Alternative Fuel Vehicle Rulemaking in August 2009. The CPUC has issued several policy decisions through its Alternative Fueled Vehicles Rulemaking, launched in 2009, that address regulatory barriers to help foster widespread adoption of electric vehicles and the provision of the electric vehicle charging services. These decisions have also addressed a number of issues related to system impacts and cost implications to ensure EV deployment is done in a manner that maintains system reliability and reasonable rates. The Commission announced that it would close the original alternative-fueled vehicles proceeding in Fall 2013, while also indicating that it intends to open a new proceeding to address new issues.
	WATER SECTOR					
W-3	CPUC, CEC, SWRCB, DWR	Water and Energy Conservation	TBD	In 2011, the CPUC joined the Water and Energy Team of the Climate Action Team (WET-CAT) as a third agency co-chair, and joined the SWRCB in developing the Governor's Office Water and Energy Policy Initiative currently under development. Finally, the CPUC has opened a rule making to develop a comprehensive policy framework for recycled water for investor-owned water companies.	TBD	The Water and Energy Team of the Climate Action Team (WET-CAT) is implementing 6 measures including 5 mitigation measures and one financing measure: Recycled water, water use efficiency, water systems efficiency, storm water capture and reuse and low impact development, renewable energy generation in the water sector, and the development of a public goods charge for water. In 2011, the CPUC joined the WET-CAT as a third agency co-chair, and joined the SWRCB in developing the Governor's Office Water and Energy Policy Initiative currently under development. Finally, the CPUC has opened a rule making to develop a comprehensive policy framework for recycled water for investor-owned water companies.
Total Reductions Expected from CPUC Led Strategies					**42.4**	

CPUC NOTES: * GHG Reduction goals for PUC measures are taken from ARB's AB 32 Scoping Plan. Unless otherwise noted, values represent statewide reductions for the measures and are not prorated to the CPUC jurisdictional utilities' share.

** The EPS prevents CA utilities from entering into long-term contracts with inefficient generation resources, which will in effect prevent such resources from being built to serve CA load. A reduction calculation would involve speculation about amount of these resources that would have been built in the absence of the EPS.

State Agency Greenhouse Gas Reduction Report Card: Table 2

Scoping Plan: Strategy Number or Chapter / Section	Agency[1] and Sector	Name	Implementation Timeline	Activities since last Report Card	Expected GHG Emission Reductions in 2020[2] ($MMTCO_2e$)	Brief Description
	Department of General Services (DGS)					
	GREEN BUILDINGS					
GB-1	DGS	Green Buildings Initiative	Ongoing		Reductions specified by substrategy (below)	This project focuses on implementing green building measures in new and existing buildings, including LEED certification, Retro-commissioning, Retrofit projects, and on-site clean generation projects (details included in substrategies described below).
GB-1: substrategy 1	DGS, State Agencies	New state buildings	Ongoing: All new state buildings constructed to LEED-Silver standards	Although very few new building projects are beginning, 13 LEED-NC (New Construction) & LEED-CI (Commercial Interiors) certifications were received for new buildings and tenant spaces in 2012 (560K sq. ft.).	0.1	Ensuring all new and renovated state buildings are built to LEED-NC (New Construction) Silver or higher standards. This estimate is based on achieving LEED-NC certifications at a rate consistent with what was achieved in 2007-2008.
GB-1: substrategy 2	DGS, State Agencies	Existing state buildings	All existing State buildings over 50,000 SF in size to be LEED-EB certified by 2015	DGS enrolled in U.S. Green Building Council LEED Volume Certification to streamline LEED-EB (Existing Buildings) certification, internalize, and greatly reduce costs. Four new state leases in existing buildings LEED-EB certified in 2012.	0.88	Attain LEED-EB (Existing Buildings) certification for all existing buildings over 50,000 square feet in size. This estimate is based on the LEED certification of 60 DGS buildings by 2020.
GB-1: substrategy 3	State Architect, Office of Public School Construction, Department of Education	Schools	Ongoing: California Schools encouraged to achieve green standards	High performance school bond funds are diminishing due to ties to diminishing school bond funding. 41 High Performance Incentive Grants issued in 2012, totalling $13M.	0.16	Various activities to encourage California schools to be built and operated to high levels of energy and environmental performance. This estimate is based on 40 percent of California schools constructed/renovated to LEED and Collaborative for High Performance Schools standards by 2020.
GB-1: substrategy 4	DGS, State Agencies	Leased Buildings	Ongoing: Encourage owners/occupants to implement green building measures	All new build-to-suit leases still being built LEED Silver or higher, as well as large leases in existing buildings.	0.25	Now mandatory energy and environmental improvements for leased buildings. This estimate is based on all new build-to-suit leases constructed to LEED standards and continuing to educate owners/occupants on the benefits of green buildings.
GB-1: substrategy 5	DGS, State Agencies, CSU/UC	Distributed Generation	Ongoing: Investigate implementation of clean/renewable on-site generation	On-going efforts increased on-site renewable generation capacity by 17 MW during 2012, & 24 MW more by the end of 2013.	0.16	Implement clean renewable energy generation projects at state facilities. It is anticipated that at least 50 MW of clean/clean renewable generation will be installed in state facilities by 2020. Installations will consist of Solar Photovoltaic, Fuel Cell, Wind and Solar Thermal generation projects.
GB-1: substrategy 6	DGS, State Agencies, CIWMB, DTSC	Environmentally Preferable Purchasing (EPP)	Ongoing: Minimize energy and resource impacts from procured commodities	Identification of appropriate metric and baseline by commodity is in progress.	*	Develop environmentally preferable purchasing specifications, contracts and guidelines to promote the use of commodities that lower energy use, increase recycling and reuse and reduce the emission of greenhouse gasses. Develop metrics to help assess significance of impact reduction.
GB-1: substrategy 7	California Building Standards Commission, CEC, DGS, State Architect, HCD, OSHPD	Green Building Code Development	Ongoing	CALGREEN 's intervening code (planned to take effect July 1, 2015) is proposing moving voluntary electric vehicle conduit requirements into mandatory. Additionally, construction and demolition waste diversion rates are proposed to increase from 50 to 65 percent.	2.9	California adopted the first-in-the-nation Green Building Standards Code (CALGREEN) in 2008, which became effective on August 1, 2009. It established voluntary standards. The Building Standards Commission adopted a 2010 edition of this code in January of 2010, composed of both voluntary and mandatory measures to further promote green buildings. The 2010 CALGREEN code took effect January 1, 2011. The 2013 California Building Standards Code (T-24) takes effect January 1, 2013, except for Part 6, which takes effect July 1, 2014. Voluntary reductions estimated at 3.6 MMT. Mandatory reductions estimated at 2.9 MMT. (Source: ARB)
	TRANSPORTATION SECTOR					
Appendix C, Section 2.B.	DGS, State Agencies	Right-size the State Fleet	Ongoing	In 2011, over 7,000 state fleet assets, including 4,200 passenger vehicles, were identified for reduction. DGS Office of Fleet and Asset Management (OFAM) is anticipated to conclude its Executive Order (EO) B-2-11 fleet reduciton activities in FY 13/14.	0.2	This measure focuses on reducing the number of State vehicles with the goal of increasing the efficiency of vehicle uses and assignments. A typical effect of right-sizing is a reduction in the number of vehicles in the fleet overall.
Appendix C, Section 2.B.	DGS, State Agencies	Removing Higher-Polluting Vehicles from the State Fleet	Ongoing	In 2012, EO B-16-12, requires that zero emission vehicles (ZEVs) replace gas powered vehicles (10-percent by 2015 and 25-percent by 2020). To date, the State of California has purchased 70 plug-in hybred electric vehicles and battery-electric vehicles since the implemention of EO B-16-12.	0.4	After the state fleet is right-sized we will continue to identify the most polluting vehicles in the state fleet and replace those vehicles with greener more fuel efficient vehicles utilizing the Fleet Asset Management System and the Vehicle Allocation Methodology (VAM). We will continue working with other state agencies on cost effective vehicle replacement strategies which will include the institution of default compact vehicle class size for future vehicle procurements..
Appendix C, Section 2.B.	DGS, State Agencies	Actively manage vehicle miles traveled and reduce petroleum consumption	Ongoing	Vehicle allocation methodology evaluated all vehicles. Utilization will result in car sharing/reduced trips. DGS OFAM continues to reduce vehicle miles travelled and petroleum use acheived through State fleet oversight and specifically the vehicle acquisition approval process. The process allows DGS OFAM to maintain fleet sizes and promote fuel efficient vehicles where feasible.	0.2	Eliminating trip redundancy to optimize vehicle utilization reduces the number of vehicle miles traveled, GHG emissions, criteria pollutants, and maintenance costs. Actively managing fuel consumption meets objectives by decreasing petroleum use through the increased use of renewable and alternative fuels for necessary business travel. By combining all three strategies listed above the State fleet is expected to reduce petroleum consumption by 20 percent or 9 million gallons of gasoline and diesel.
	Total Reductions Expected from DGS Led Strategies				**5.3**	

DGS NOTES: * Unable to determine projected GHG reductions arising from EPP Program due to the relative immaturity of computational algorithms and lack of data collection processes in this area.

State Agency Greenhouse Gas Reduction Report Card: Table 2

Scoping Plan: Strategy Number or Chapter / Section	Agency[1] and Sector	Name	Implementation Timeline	Activities since last Report Card	Expected GHG Emission Reductions in 2020[2] ($MMTCO_2e$)	Brief Description
	DEPARTMENT OF WATER RESOURCES (DWR) STRATEGIES					
	WATER SECTOR					
W-1	DWR, SWRCB	Water Use Efficiency	Dependent upon resources; various milestones through 2020.	Continued implementation of "20x2020".	1.4 [3]	Promote greater implementation of water conservation measures, including best management practices, to improve efficiency. Implement the Governor's 20x2020 Plan (20 percent reduction in water use by 2020), and implement provisions of SBx7 7, the Water Conservation Act of 2009 (Steinberg, Chapter 4, Statutes of 2009-2010 Seventh Extraordinary Session).
W-6	DWR	Public Goods Charge on Water	Will not be implemented	None	N/A	A fee to be used to fund end-use water efficiency improvements, system-wide efficiency projects, water recycling, and other actions that improve water and energy efficiency and reduce GHG emissions.
W-3, W-5; Appendix, Volume 1	DWR	Reid Gardner Power Plant Divestiture/renewable energy procurement/energy efficiency	2013	DWR continued implementation of its Climate Action Plan, including procurement and development of renewable energy supplies, termination of its ownership interest in Unit 4 at Reid Gardner Station, and energy efficiency improvements.	1.2	DWR will divest its partial interest in a Nevada coal plant by July 2013. With this action, as well as DWR's procurement of renewable energy and on-going energy efficiency programs, including pump refurbishments, CO_2 emissions from DWR's power portfolio will decrease an estimated 1,180,000 MT from its 1990 levels. Thus, by 2014, DWR's emissions will be 40-50 percent lower than its 1990 levels.
Total Reductions Expected from DWR Led Strategies					**2.6**	

State Agency Greenhouse Gas Reduction Report Card: Table 2

Scoping Plan: Strategy Number or Chapter / Section	Agency [1] and Sector	Name	Implementation Timeline	Activities since last Report Card	Expected GHG Emission Reductions in 2020[2] ($MMTCO_2e$)	Brief Description
	DEPARTMENT OF HOUSING AND COMMUNITY DEVELOPMENT STRATEGIES					
	***TRANSPORTATION SECTOR** *					
T-3: C-56	HCD	Regional, Transportation-Related Greenhouse Gas (GHG) Targets.	Beginning 2010	HCD approved Regional Housing Need Allocation (RHNA) plans for these 7 regions: Bay Area (ABAG), Butte County, Lake County, Mendocino County, San Luis Obispo County, Santa Barbara County, and Sierra-Nevada Counties. HCD determined RHNA for 17 regions (counties) not represented by a Council of Governments (COG) and distributed RHNA shares to 17 counties and 32 cities for each locality to plan for in submitting their housing element for HCD approval.	Not Applicable. Regional transportation entities provide GHG reduction information to Air Resources Board.	HCD RHNA determinations specify number of new housing units for regional and local planning entities to plan for and coordinate and integrate with the SCS and RTP for housing and transportation planning to be consistent. Regional planning entities must allocate a share of RHNA to each local gov't to plan for in updating its housing element. HCD is required to approve region RHNA Plans and local gov't housing elements that describe local land-use decisions regarding housing siting and densities, etc. and consideration of factors relevant to achieving reductions in vehicle trips and GHG emissions.
	***LAND USE** *					
C-82	HCD	Housing Element Technical Assistance	Beginning in 2010 and ongoing.	HCD conducted 5 housing element technical assistance workshops among a few coastal and northern california counties. A SB 375 (Steinberg, Chapter 728, Statues of 2008) technical assistance paper was distributed to all planning entities that included an appendix addressing SB 375 questions and answers.	Not quantifiable.	Housing Element Technical Assistance: HCD will update technical assistance and outreach efforts to include climate change and greenhouse gas emission reductions objectives in technical assistance materials and resources for local governments to use and include in updating their housing elements. This will include identification of new land use strategies that both address housing supply and affordability requirements (density of housing, infill potential, energy conservation in residential development both in construction and retrofitting and design) and reduction in greenhouse gas emissions.
C-83	HCD	Affordable Housing Finance Incentives	Beginning 2011 and ongoing.	HCD added scoring criteria to 2013 funding applications for the Transit Oriented Development (TOD) housing program to support GHG reduction and energy efficiency objectives.	Not quantifiable.	Implementation of CalGreen building standards underway after delay resulting from significant reduced local development activity and economic and budget constraints.
C-49	HCD	Local Assistance on GHG Reduction Strategies	Beginning 2011 and ongoing.	Additional technical assistance and outreach efforts were completed pursuant to above description for C-82.	Not quantifiable.	HCD staff makes presentations at statewide, region, and local conferences and workshops to educate housing developers, housing advocacy groups, business and industry groups, environmental advocates, and local government housing and planning departments about the relationship between planning well for housing and achieving climate change objectives and effective housing and land use strategies to reduce greenhouse gas emissions.
C-76	HCD	Regulatory Relief to GHG Emission Reduction Land Use Strategies	FY 2012-13	MPOs in late 2013 initiated a self-assessment survey that may provide HCD useful information to review in 2014. The MPO self-assessment survey will collect information about SCS/RTP process, implementation, and lessons learned.	Not quantifiable.	HCD will review information regarding regulatory barriers to housing and efficient land use strategies and prepare recommendations on how such barriers can be addressed.
Total Reductions Expected from BTH Led Strategies					**N/A**	

HCD NOTES: * Transportation / Land Use Sectors: Responsibility for many of the reductions previously associated with land use, smart growth and related strategies has shifted to the ARB to ensure consistency with the Scoping Plan and the mandates of SB 375 (Steinberg, Chapter 728, Statutes of 2008). HCD will play an active role in the implementation of these and related land use measures through a variety of planning efforts and programs.

State Agency Greenhouse Gas Reduction Report Card: Table 2

Scoping Plan: Strategy Number or Chapter / Section	Agency[1] and Sector	Name	Implementation Timeline	Activities since last Report Card	Expected GHG Emission Reductions in 2020[2] ($MMTCO_2e$)	Brief Description
	CALIFORNIA HIGH SPEED RAIL AUTHORITY STRATEGIES					
	Transportation					
Not in Scoping Plan	HSR	Caltrain Electrification	December 1, 2012	Environmental planning work underway for electrification	0.018	The Authority has provided funding to Caltrain to carry out electrification of the Caltrain system between San Jose and San Francisco
Total Reductions Expected from HSR Strategies					**0.0 ***	

HSR notes: * Expected GHG reductions in 2020 total less than a tenth of $MMTCO_2e$.

State Agency Greenhouse Gas Reduction Report Card: Table 2

Scoping Plan: Strategy Number or Chapter / Section	Agency[1] and Sector	Name	Implementation Timeline	Activities since last Report Card	Expected GHG Emission Reductions in 2020[2] ($MMTCO_2e$)	Brief Description
	OFFICE OF PLANNING AND RESEARCH (OPR) STRATEGIES *					
	OTHER SECTORS/STRATEGIES					
Chapter II Section A	OPR	CEQA Guidelines re: GHG emissions	Ongoing	Ongoing	No Direct Reductions	OPR developed California Environmental Quality Act (CEQA) guidelines to help lead agencies address greenhouse gas impacts. A comprehensive update to the CEQA guidelines will be occurring in 2014.
Not in Scoping Plan	OPR	General Plan Guidelines: Update to the Circulation Element Section	December 15, 2010	Completed	No Direct Reductions	OPR developed an "Update to the Circulation Element, Complete Streets and the General Plan". This publication is in response to AB 1358 (Leno, Chapter 657, Statutes of 2008) requiring cities and counties to modify the circulation element of the general plan to provide for a balanced multi-modal transportation network. Final publication was completed in December 2010.
Chapter II Section B	OPR	Technical Advisory and Technical Assistance	Ongoing	Ongoing	No Direct Reductions	OPR is developing a 'Technical Advisory' to provide advice to state and local agencies on preparing climate action plans that integrate with CEQA, planning and zoning law and climate change legislation. Other technical advisories have support distributed generation, zero emissions vehicles and other Governor/State priorities. On an on-going basis, OPR provides technical advice, including training on climate action planning and related implementation measures, to local and state agencies.
Not in Scoping Plan	OPR	CEQA Guidelines re: Infill and transportation emissions	Ongoing through 2014	Ongoing	No Direct Reductions	SB 226 (Simitian, Chapter 469, Statutes of 2011) requires OPR to develop performance standards for certain infill projects that promote, among other policy objectives, the reduction in greenhouse gas emissions. SB 743 (Steinberg, Chapter 386, Statutes of 2013) requires OPR to propose alternatives to Level of Service (LOS) as a metric for transportation which will result in metrics being changes to support activities that have a lower greenhouse gas emissions component relative to historic metrics.
Not in Scoping Plan	OPR	General Plan Guidelines: Comprehensive Update	Ongoing through mid 2014	Ongoing	No Direct Reductions	OPR will engage in a comprehensive update to the General Plan Guidelines, which will include, among other topics, ways for local governments to address climate change in their General Plans.
Not in Scoping Plan	OPR	Environmental Goals and Policy Report (EGPR)	Ongoing through 2014	Ongoing	No Direct Reductions	The Enviornmental Goals and Policy Report (EGPR) is required by statute to be competed every four years and provides the framework for State action across a wide variety of topic areas, including climate change and greenhouse gases. Although goals and policies in the EGPR help guide the development of plans such as the AB 32 (Nunez, Chapter 488, Statutes of 2006) scoping plan, the EGPR itself does not have direct emissions reductions.
Not in Scoping Plan	OPR	ZEV Action Plan	December 15, 2012	Completed	No Direct Reductions	OPR is helping to develop a zero-emission vehicle (ZEV) Action Plan to implement the Governor's ZEV Executive Order, which establishes several GHG emission milestones, highlighted by the target of 1.5 million ZEVs in California by the year 2025.
Total Reductions Expected from OPR Strategies					**0.0 ***	

OPR NOTES: * OPR has important programmatic responsibilities but does not have emission reduction regulatory authority.

State Agency Greenhouse Gas Reduction Report Card: Table 2

Scoping Plan: Strategy Number or Chapter / Section	Agency[1] and Sector	Name	Implementation Timeline	Activities since last Report Card	Expected GHG Emission Reductions in 2020[2] ($MMTCO_2e$)	Brief Description
	STATE WATER RESOURCES CONTROL BOARD (SWRCB) STRATEGIES					
	WATER SECTOR					
W-2	SWRCB, DWR, CEC, CPUC	Water Recycling	By 2020	In 2013 the State Water Board updated its Recycled Water Policy to address monitoring for constituents of emerging concern. The State Water Board provided $42 million in loans for recycled water facilities and over $6 million in grants for recycled water planning and construction. The Regional Water Quality Control Boards have been completing salt and nutrient plans to as part of implementation of the Recycled Water Policy.	0.3 [3]	This measure proposes the production and use of additional recycled water where the recycling of treated effluent is not maximized at wastewater treatment plants located in areas where imported water is used. Implementation of water recycling projects would be prioritized for those areas that discharge to water bodies from which the wastewater cannot otherwise be easily recovered, such as the ocean and brackish water bodies. GHG benefits would be realized where recycled water would consume less energy than water obtained from existing sources.
W-4	SWRCB	Storm Water Reuse	By 2020	The Los Angeles and San Diego Regional Water Quality Control Boards approved updated municipal stormwater permits with incentives for local agencies to infiltrate and capture more stormwater for urban use. The State Water Board funded $76 million in low-impact development projects through Proposition 84 stormwater grants. The State Water Board also produced a white paper on the amount and location of additional stormwater capture necessary to meet the GHG emission reduction target set forth in the 2008 Scoping Plan. In addition, the State Water Board will develop a strategic stormwater plan during 2014.	0.2 [3]	This measure proposes that Low Impact Development (LID) be required to maximize the infiltration and/or capture of storm water to increase local water supplies. Where favorable soil and geologic conditions exist, storm water would be infiltrated to increase groundwater supplies. In locations where potential infiltration is either limited or not recommended, capture and storage for on-site non-potable use would be encouraged. GHG benefits would be realized where local water would consume less energy than water obtained from existing sources.
Total Reductions Expected from SWRCB Led Strategies					**0.5**	

TABEL 2 FOOTNOTES:

1. Where multiple agencies are noted, the first is the lead agency and the others work in collaboration to achieve strategy goals.

2. Measures shown with GHG emission reduction shown as "TBD" represent on-going or future efforts for which quantification has not been completed.

3. GHG emission reduction estimate not included in calculating the total reductions needed to meet the 2020 target as established in the Scoping Plan. (See Scoping Plan for details).

4. These strategies will not result in direct reductions of GHG emissions but will facilitate reductions through associated voluntary actions and potential future regulatory efforts.

5. These programs pre-date the Scoping Plan but are included here to document on-going efforts. GHG reductions are not included in the total for the agency as they do not provide additional reductions over and above what would have occurred absent AB 32.

TABLE 3 - GREENHOUSE GAS (GHG) EMISSION REDUCTIONS

The following summarizes the totals from Tables 1 and 2. Reductions shown are Million Metric Tons of CO_2 equivalent ($MMTCO_2e$) and are those achieved within California during the given year. The annual figures are not cumulative and do not reflect reductions that might occur out-of-state.

TABLE 3a: GHG EMISSION REDUCTIONS ACHIEVED

Agency	GHG Emission Reductions Acheived in 2009[1]	Measured GHG Emission Reductions Achieved in 2010[1]	GHG Emission Reductions Achieved in 2011[1]	GHG Emission Reductions Achieved in 2012[1]
ARB	0.5	1.1	4.8	9.1
CAL FIRE	2.3	2.3	2.7	2.5
CalRecycle	0.0	0.0	0.0	0.0
Caltrans	0.1	0.1	<0.1	<0.1
CDFA	0.0	0.0	0.0	0.0
CEC	1.7	2.7	3.7	4.3
CPUC	3.5	5.8	10.0	10.9
DGS [3]	< 0.1	< 0.1	<0.1	<0.1
DWR	0.0	0.0	0.0	0.0
HCD [4]	0.0	0.0	0.0	0.0
OPR [4]	0.0	0.0	0.0	0.0
SWRCB	0.0	0.0	0.0	0.0
Additional GHG emissions reductions from previous year		3.9	9.2	5.6

TABLE 3b: Agency GHG Targets for 2020

Agency	Expected GHG Emission Reductions in 2020 from Proposed Strategies [2]
ARB	86.8
CAL FIRE	0.0
CalRecycle [5]	1.0
Caltrans	0.5
CDFA	0.0
CEC	4.6
CPUC	42.4
DGS [3]	5.3
DWR	2.6
HCD [4]	0.0
HSR	0.0
OPR [4]	0.0
SWRCB	0.5
Total	**143.7**

Notes

1. The values in this column are taken from the totals in Table 1. The figures may reflect emission reductions from programs implemented before AB 32 was enacted in order to provide a broad picture of all on-going GHG related efforts. Figures for years prior to the most recent year come from previous year Report Cards.
2. The values in this column are taken from the agency totals in Table 2. These figures only reflect reductions from programs implemented since AB 32 was enacted. The total aggregate GHG reduction cannot be directly calculated from these values due to issues of double counting. Example: the Green Building measures achieve reductions, primarily, by reducing energy consumption. Such reductions would be captured in the energy sector but the measure would be implemented by non-energy sector agencies such as DGS.
3. Most of the GHG reductions from DGS measures are captured within the energy sector. The target is for measures that are not counted elsewhere.
4. These agencies have important programmatic responsibilities but do not have emission reduction regulatory authority.
5. Only 1.0 $MMTCO_2e$ of the CalRecycle total shown on Table 2 is included in the target because the balance of the reductions may occur largely out-of-state.

GHG Inventories of State Agencies

Starting with the January 2010 report card, we began including information about GHG inventories prepared by the CAT member agencies. These inventories were each prepared independently using the Climate Action Reserve's *General Reporting Protocol*.

In April of 2012, Governor Brown issued Executive Order B-18-12 which, among other things, requires all state agencies to reduce greenhouse gas emissions by 10 percent by 2012 and 20 percent by 2020, as measured against a 2010 baseline. In order to track progress, all state agencies were instructed to develop annual GHG inventories and enter them into The Climate Registry's *Climate Registry Information System*, or CRIS.

In order to avoid double counting in this state-government-wide reporting effort, starting with 2010 there have been some changes in the way departments and agencies are reporting their emissions. For example, in most cases, departments and agencies occupying DGS buildings, no longer include emissions from those buildings in their inventories. Instead, DGS is reporting those emissions in its own inventory. For this reason, it would be advised to only compare emissions from calendar year 2010 forward.

Additionally, while changes in year over year GHG emissions can result from changes in the way state agencies do business, they can also be attributed to things beyond the control of individual agencies. In particular, California utilities rely extensively on hydropower for base-load energy generation. In dry years, more electricity will be generated using fossil fuels and the increase in GHG emissions for a given amount of electricity can be substantial. Also, weather conditions (cold or hot) can have a significant impact on buildings. For this reason, observing longer-term, multi-year trends will be more useful for policy makers.

The data below is organized by Agency though many departments are reporting invidually.

Table 4: Climate Action Team - GHG Inventory Status

INVENTORY STATUS >	Member of The Climate Registry	Inventory Completed (CY)	Emissions in Metric Tons CO_2E for each year calculated				NOTES
			Year	Direct	Indirect	Total	Green indicates verified inventory
Calfornia State Transportation Agency							
The following Boards and Departments calculate emissions separately:		2007	2007	136,587	93,996	230,583	
		2008	2008	75,546	111,331	186,877	
		2009	2009	98,423	131,227	229,650	
		2010	2010	83,695	98,918	182,613	
		2011	2011	82,729	108,672	191,401	
- *CalTrans*	Yes	2012	2012	83,049	87,851	170,900	
California Environmental Protection Agency							
-Totals include inventory data for the ARB, CalRecycle, OEHHA, DPR, DTSC and SWRCB		2005	2005	2,632	4,914	7,546	
		2006	2006	3,119	4,780	7,899	Significant decrease in direct emissions due to sharp reduction in reportable vehicle emissions.
		2007	2007	3,050	5,545	8,595	
		2008	2008	3,177	5,478	8,655	
		2010	2010	2,364	4,884	7,248	
		2011	2011	2,120	4,952	7,072	
	Yes	2012	2012	1,964	4,704	6,668	
		2010	2010	6,381	1,974	8,355	
		2011	2011	6,065	1,966	8,031	
California Department of Food and Agriculture	Yes	2012	2012	5,558	1,948	7,506	

INVENTORY STATUS >	Member of The Climate Registry	Inventory Completed (CY)	Emissions in Metric Tons CO_2E for each year calculated				NOTES
			Year	Direct	Indirect	Total	Green indicates verified inventory
		2010	2010	0	1,125	1,125	
		2011	2011	320	990	1,310	
California Emergency Management Agency	Yes	2012	2012	303	904	1,207	
		2004	2004	92	849	941	
		2005	2005	432	1,084	1,516	
		2006	2006	515	1,228	1,743	
		2010	2010	167	892	1,059	
		2011	2011	156	850	1,006	
CA Public Utilities Commission	Yes	2012	2012	149	805	954	
Health and Human Services Agency		2010	2010	5,320	5,909	11,229	Increase in square footage from 2010 to 2012
		2011	2011	6,244	5,026	11,270	
- Department of Public Health	Yes	2012	2012	5,855	4,768	10,623	
Natural Resources Agency							
- The following Boards and Departments calculate emissions separately:		2007	2007	41,882	7,460	49,342	
		2008	2008	37,222	6,044	43,266	
		2009	2009	34,273	5,620	39,893	
		2010	2010	33,832	4,916	38,748	
		2011	2011	32,916	4,587	37,503	
- CalFire	Yes	2012	2012	38,355	4,664	43,019	

INVENTORY STATUS >	Member of The Climate Registry	Inventory Completed (CY)	Emissions in Metric Tons CO_2E for each year calculated				NOTES
			Year	Direct	Indirect	Total	Green indicates verified inventory
Natural Resources Agency, continued							
							A significant increase in 2012 indirect emissions was due to a 21% increase in SMUD's delivered electricity GHG emissions factor, and an increase in office space at a leased facility. All of CEC's emissions are included in DGS' inventory, except for indirect GHGs from leased office space (88 MT).
		2003	2003	22	576	598	
		2008	2008	14	948	962	
		2009	2009	11	863	874	
		2010	2010	4	903	907	
		2011	2011	3	894	897	
- *CA Energy Commission*	Yes	2012	2012	3	1,347	1,350	
		2007	2007	15,716	18,303	34,019	
		2008	2008	15,175	14,597	29,772	
		2009	2009	13,557	9,026	22,583	
		2010	2010	13,223	8,483	21,706	
		2011	2011	13,793	8,490	22,283	
- *Dept. of Fish & Wildlife*	Yes	2012	2012	14,447	8,318	22,765	
		2007	2007	14,299	3,226,250	3,240,549	
		2008	2008	4,116	2,397,336	2,401,452	
		2009	2009	11,477	1,989,900	2,001,377	
		2010	2010	864,416	1,157,503	2,021,919	
		2011	2011	740,434	1,212,373	1,952,807	
- *Dept. of Water Resources*	Yes	2012	2012	875,037	1,225,802	2,100,839	
- *State Parks*	Yes	2010	2010	15,833	10,988	26,821	

INVENTORY STATUS >	Member of The Climate Registry	Inventory Completed (CY)	Emissions in Metric Tons CO_2E for each year calculated				NOTES
			Year	Direct	Indirect	Total	Green indicates verified inventory
		2011	2011	17,263	12,097	29,360	
		2012	2012	17,143	13,730	30,873	
Office of Planning & Research	Yes						OPR's inventory is included in DGS's report.
Government Operations Agency		2006	2006	56,135	80,434	136,569	The Department of General Services's inventory includes much of the operations (including buildings and vehicles) of many other agencies.
- The following Department calculates emissions separately:		2007	2007	58,124	90,739	148,863	
		2008	2008	60,256	83,678	143,934	
		2009	2009	55,324	80,009	135,333	
		2010	2010	52,137	81,181	133,318	
		2011	2011	55,286	80,073	135,359	
- Dept. of General Services	Yes	2012	2012	50,040	67,554	117,594	